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November 13, 1930

Engineering News-Record

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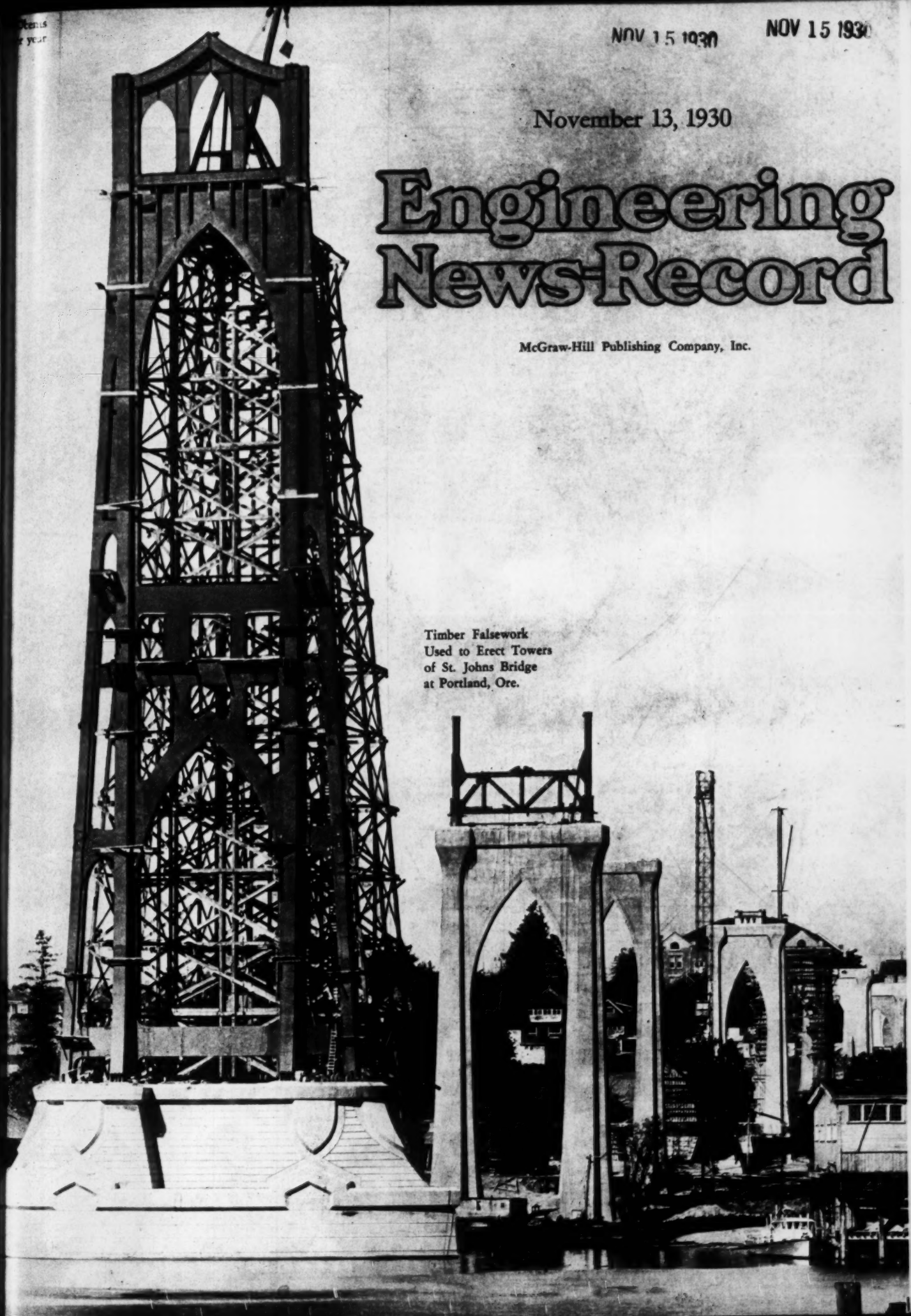

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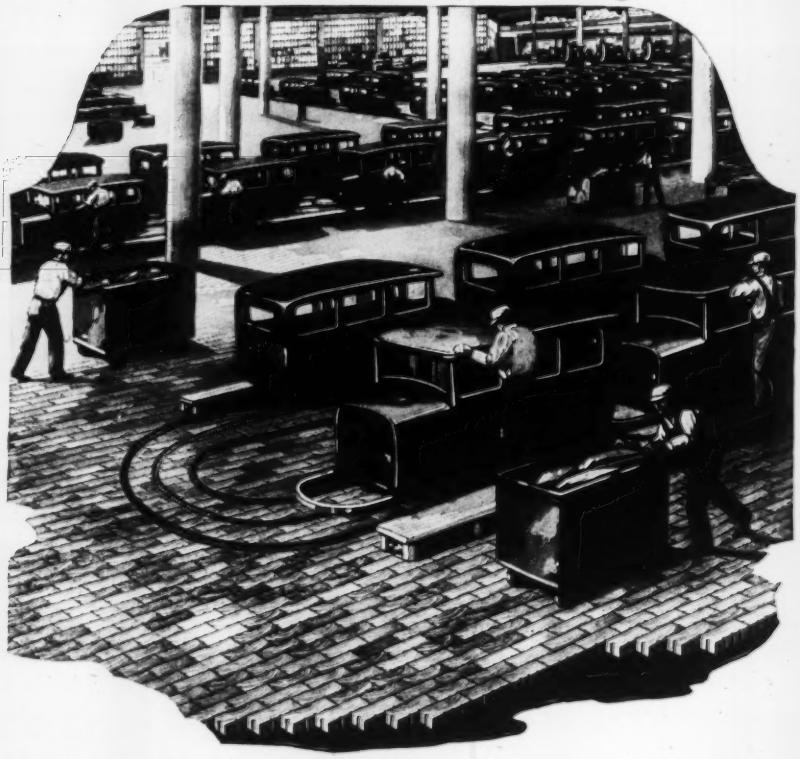

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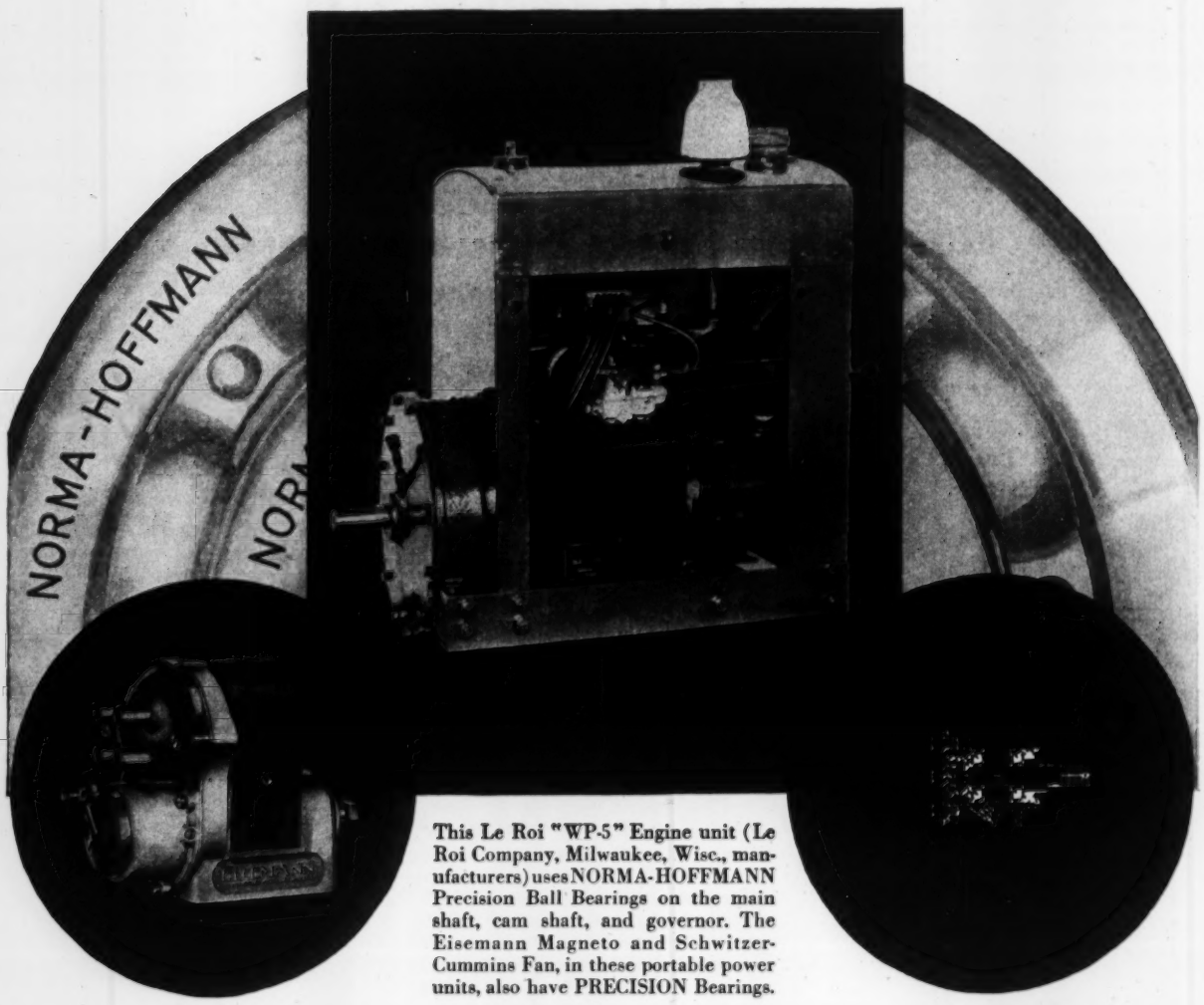

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ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION — ESTABLISHED 1874

DEVOTED TO CIVIL ENGINEERING AND CONTRACTING

F. E. SCHMITT, *Editor*

Volume 105 NEW YORK, NOVEMBER 13, 1930 Number 20

More Public Works

LARGE bond-issue votes were approved in last week's election throughout the country. They determined the expenditure of three to four hundred million dollars on city and state improvements during the next year or two. A few proposed issues failed to receive approval, but they are greatly in the minority, though some are of much local importance, as, for example, that for the Los Angeles water extension project. Without exception the issues approved represent new works necessary for the improvement of public service in their localities, and no philanthropic anticipation of future needs was included. Before the election it was reported that the President's unemployment relief commission had urged voters everywhere to approve bond issues, but we do not believe that such counsel was intended to induce the voters to disregard their convictions. In a specific case, the referendum on a bond issue to build the great Golden Gate bridge, supporters of the measure advertised that the President's commission had approved the bond issue—a most reprehensible procedure. Fortunately the project won with so large a vote as to show that the people want it and believe it necessary and desirable. The conclusion from the very large total of favorable bond issue votes is that public-works construction in 1931 will maintain the high level of the current year, and that citizens generally are thoroughly appreciative of the necessity of a high rate of public improvement to keep the physical machinery of their communities in good working shape. This is noteworthy evidence of the growth of an enlightened public consciousness, carrying good promise of steady progress in city and state development.

Business and Philanthropy

FOLLOWING the referendums of last week come various proposals that further extension of public works be taken in hand as a means of making work to overcome unemployment present and threatening. There can be no question that it is an important desideratum to get through the winter with the highest possible employment ratio, in order to avoid extensive suffering; yet the undertaking of public works for philanthropic purposes is a new development in this country, and is of grave significance in its bearing upon the capacity of organized business. If the view shall come to prevail that relief of the business depression cannot be obtained through normal business processes but must be placed on a Red Cross basis, it will be strong evidence of the impotence and incapacity of organized business, and will mean that in the future business must take second place to government activities in any vital economic conjuncture. Fundamentally, public works find justification only in their own individual necessity, just as do the works undertaken by an individual or a corporation; if the need for a public project is to be disregarded and the project undertaken merely to make work, because private business is unable to provide enough work, we must conclude that the country has evolved to a point where private business is only incidental and public business is the rock on which our existence rests. But we are not ready to believe that this is the case, and that private business is unable to keep its house in order and provide for its family—both worker and bond holder. And therefore we do not believe that the present cry to make work by undertaking public works not now needed and not within the present voluntary capacity of the taxpayer is in order.

Filtration for Chicago

FILTRATION of the Chicago water supply was advanced a long step at the Nov. 4 election by a 3 to 1 favorable referendum vote. Though lacking newspaper support, and hidden on a ballot the size of a bed sheet, yet the filtration question was singled out by interested citizens and approved. The large majority may have been due to the fact that the item carried no appropriation or indication of cost, but in spite of this the favorable vote is significant. Credit for the result belongs largely to the engineers in the city service, who for several years past have seized every opportunity to explain and advocate filtration at public meetings. No small contribution toward swaying public opinion was made through the production and distribution of clear, sparkling water at a large filter testing and demonstrating plant, to which it is said a thousand automobiles a day come for the week's supply of filtered water. A further evidence of growing public interest in filtration is afforded by the fact that petitions to the city council to put the question on the ballot were signed by 130,000 consumers. The financing problem is yet to be solved, but when such a mandate as this is delivered the money will be forthcoming. Raising the rates from 6½c. to 8½c. per 1,000 gal. is one means of providing it. Another is getting a favorable decision from the supreme court on the last legislature's authorization to issue water certificates which do not count against the city's debt limit; this would permit $3,000,000 bonds to be issued per year. All in all the favorable vote was most heartening to the engineering profession in Chicago, both official and private, since engineers have advocated filtration for years and have taken every opportunity to further the cause.

Combining Waterwheel Types

TWO types of hydraulic turbines are used in the new Flint River power plant in Crisp County, Ga., in order to make the most of the peculiar river conditions. A flow of approximately 1,800 sec.-ft. is available 80 to 100 per cent of the time. For only about half the year the full normal head of 30 ft. prevails, while at other times the head is less, either because of drawing down the reservoir or because of high tailwater level. Backwater

occurs when the volume of flow in the river is large, frequently cutting the head down to 20 ft. and occasionally to 12 or 15 ft. Here was an unusually bad example of a well-known problem difficult to meet with Francis wheels. But with the more recent development of propeller waterwheels the site offered sufficient possibilities to bring about the construction of a hydro-electric plant combining the advantages of both types of turbines, as described in this issue. Doubtless there are many similar power sites in this country which heretofore have not been particularly attractive. If actual results obtained in the Flint River plant coincide with predicted results, what has been accomplished there should stimulate a restudy of many power sites heretofore discarded as not being sufficiently attractive to warrant their development.

Water Power in Politics

ENTIRELY aside from its engineering features, the Flint River power plant already has assumed an importance far out of proportion to its size. It was built by Crisp County as a publicly owned utility to produce and sell electric power in competition with the privately owned utility which now supplies southern Georgia. When the new plant was put into service recently, it began to sell power at a figure considerably below that of the private company supplying the region. The latter responded by reducing its rate in the county, not to that of the publicly owned plant, but to a still lower figure. Whereupon the fat was in the fire, for the public utility law of Georgia does not permit power companies to make different rates for different localities. Other communities in the state protested, with the result that the state utility commission ordered the company to show cause why it should not grant similar rate reductions elsewhere. Subsequently the company obtained an injunction against that order. The matter is still very much in the air, but it looks now as if the power company's hasty attempt to kill off competition of the Crisp County plant will cost it much in both goodwill and in dollars and cents. Had the company been content to await the slower processes of obtaining redress through the courts for what it believes to be unfair competition, it would have maintained public confidence in the fairness of its rates. This it has sacrificed.

Hydraulic Dredge Evolution

FOLLOWING the excellent account of modern mechanical equipment for hydraulic dredges given by O. P. Erickson in our issue of April 3, 1930, a further article by the same author this week presents working directions and data. It affords an unusually graphic picture of an earth-handling device which has had its development largely in America. There is no machine for moving earth either from dry pits or from under water which handles in such large volumes so wide a range of materials that can be excavated without blasting. Dredge output is a function of several factors, so that absolute figures have always to be qualified in making comparisons, but volumes reaching a million and a half yards a month and fifty thousand yards a day are impressive facts under any set of conditions. Even the smaller (and actually very conservative) average outputs given in this issue are impressive. It will be plain to the reader that these performances arise equally from a very high development of power and control mechanism on the dredge itself and from advance in planning and in the technique of dredge operation. A brief statement cannot enumerate details, but with a little extension of vision the problems and duties indicated by the author make it clear that hydraulic dredge operation according to modern standards of efficiency requires engineering and managing ability of the first order. In presenting this general lesson the two articles in question have as great value as in their discussion of exact technique by a master operator of modern dredging fleets.

Tunneling Innovation

SHIELDS for driving small tunnels through soft ground are not new; neither are concrete blocks for lining small bores. Yet an ingenious combination of the two, as used on a Philadelphia job and reported on another page in this issue, stands as a distinct advance in the art of small tunnel construction. The design of the precast lining blocks, hexagonal in plan, provides for full interlocking with adjoining segments, a feature that removes one of the main objections to this type of lining. This block design and various new mechanical features of the shield provide for a constant jack thrust on every block of an entire ring of segments, yet permit easy and rapid erection of the succeeding ring. The method shows promise of economy in small tunnel driving that may make possible the elimination of much deep open-cut work with its resulting disturbance and obstruction of the surface and unsatisfactory backfilling. Small tunnels for sewer, water supply and conduit lines comprise the bulk of our underground construction. Any new and improved means of driving the soft-ground portions of these tunnels should be of interest to many engineers and contractors.

Steel Pile Development

STEEL bearing piles have taken on increased utility with the successful employment of H-beam sections in a number of recent foundation operations. This modern section of rolled steel not only has a lateral strength exceeded only by that of a round pile but also possesses ability to penetrate hard material without damage to the pile and with a minimum amount of crushing of the material penetrated. Its section also, where the pile extends up into and is incorporated with the framework of the superstructure, affords easy connections for beams and bracing. An ocean pier and a highway trestle described in this issue illustrate all these qualifications. For the strict purpose of providing a pile bearing having lateral and column strength and penetrating ability without sacrifice of frictional support, the H-section of rolled steel presents under certain conditions of bottom a degree of merit which commands attention from foundation designers. A notable example of its use purely for bearing purposes in a hard bottom where frictional resistance was highly essential is furnished by its use in an unusual manner of pier construction for the Brazos River bridge described in *Engineering News-Record*, July 17, 1930, p. 89. A different unusual use—for carrying the lateral thrust of deep trench sheeting and the vertical load of heavy street bridging—has recently been presented in New York subway construction, as described in *Engineering News-Record*, Sept. 4, 1930, p. 371. These examples exhibit not only a new development of the steel bearing pile but a new economic invasion by a rolled steel product into the territory of timber and concrete.

Have We Gone Too Far?

TRADITION has far greater influence on building than on other construction. On the side of design it makes itself felt in the relatively fixed ideas which men entertain on matters of convenience and beauty, both of which rest largely on precedent or habit. On the side of construction the effect of established craftsman methods is a similar influence of tradition. The result is a relative fixity of building practice, which on the whole is desirable.

A factor which strongly furthers this fixity of building practice is the modern system of controlling building through regulatory codes. Their prescriptions are usually narrow, partly with a view to enabling men unskilled in building science to apply them, and partly with a view to facilitating control by a highly superficial system of inspection on the part of the public building authority. They are not only narrow but also rigid, and building inspectors and municipal legislative bodies are reluctant to amend them.

Under these circumstances it is naturally difficult for new materials and the new practices which would follow them to obtain a footing in the building field. This is unfortunate in its effect. General technology has taken up many new materials in recent times, and some of its most important advances are due to them. But in building, and especially in small building, this has not been the case, and we have had to get along without the quickening influence of new facilities. Since the time when concrete was popularized, no major innovation has entered the field; the principal elements of construction have changed little in a good many years. This stagnation is due at least in part to the barriers of building codes.

Have we gone too far in producing fixation of building practices through codes? The question follows directly from the preceding statement. It leads to the further question whether it is not appropriate to the demands of present times to turn rather decidedly away from fixation and seek to make building codes invite new materials and methods rather than discourage them.

The crux of this question probably lies in obtaining reasonable guarantee that the new things will be used competently. This is not hard to accomplish, for it needs only that building be placed in responsible charge of architects and engineers—professions equipped by education and training to appraise and use materials properly. Heretofore this system of operation has been opposed by the prevailing belief that safe and satisfactory building can be brought about by means of official building supervision supplemented by rigid building codes. But the belief has not proved itself in practice; on the contrary, it appears to be one of the responsible causes underlying the high cost and inefficiency of building today.

If we compare industrial production generally with the performance of the building industry over a period of years, it is easy to see that the former has made great advance, while the latter has in effect stagnated. This is most strikingly evident at the present moment because conditions are requiring every industry to scrutinize its own procedures more closely with a view to giving best service to the community at lowest cost. Design, equipment, production and marketing systems all are being re-examined from this point of view. But in such self-scrutiny building has little to say for itself. Its costs show only slight decrease. In speed the large skyscraper exhibits gratifying performance, but other classes of building have no advance to boast of. In industrial stability, building is far behind all productive industries except agriculture; it lacks a fixed labor stock, correlation of supply and consuming elements, and continuity of operation. Altogether it is unable to respond affirmatively to the challenge respecting modern organization and efficient functioning. We are strongly convinced that both the traditional resistance to change in the building field and the fact that the door is largely closed to new materials and methods are important factors in the result.

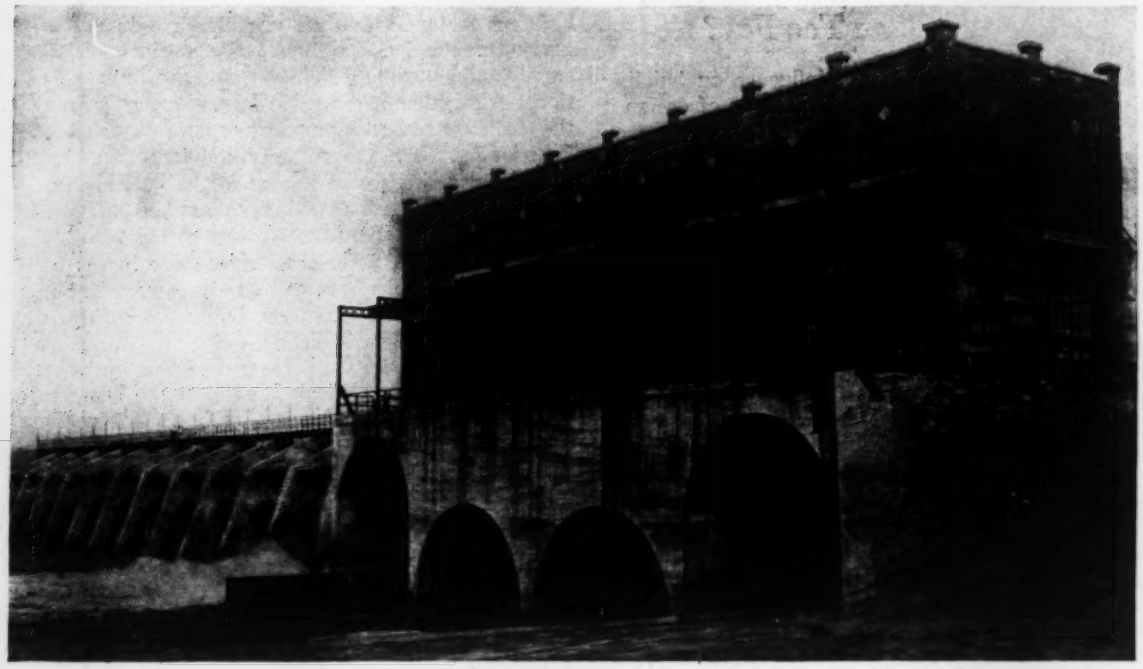
If this be true, a far-reaching change in the building industry is in order. It will surely come about in time as a matter of slow evolution, but if the reform can be accelerated it will be a distinct gain. No single cause is alone responsible for the present condition in the art, and therefore no single element is sufficient to bring reform. But building code modernization holds out promise of contributing strongly to starting the reformatory process. The many codes now being studied for revision offer opportunity to make a practical trial of the possibility.

Doubtful Jurisdiction

QUESTIONS of more than local interest are raised by the Interstate Commerce Commission's refusal to change its decision permitting the Long Island Railroad Co. to abandon its Whitestone branch. The branch is an electrically operated line entirely within the limits of the city of New York and devoted largely to serving a suburban community. Traffic on the line has been declining steadily since the city extended its rapid-transit lines into Flushing, also served by the Whitestone branch, and the railroad is faced with an expenditure of about $2,000,000 for the elimination of grade crossings on this branch.

Early this year the commission authorized the railroad to abandon the line upon condition that it substitute bus service for its coach service and make arrangements satisfactory to the state transit commission for the movement of less-than-carload lots of freight to industries now served by the branch line. State and city officials protested against this assumption by the commission of jurisdiction over a line which is both intracity and intrastate and which they believe to be essentially a part of the city's rapid-transit system rather than an interstate railway subject to the commission's jurisdiction. The commission, on the other hand, claims jurisdiction on the ground that the Long Island Railroad does an interstate business over which it has control and that the operation of this branch is inseparably connected with the operation of the system as a whole. On that basis the commission believes that the imposition of an unnecessary burden upon the Long Island Railroad constitutes an unreasonable burden upon the transportation system of the country and so constitutes a cause for action on the part of the commission.

Granting the theoretical correctness of the commission's position as to its jurisdiction over this small railway branch line, the case is so obviously one of purely local concern that the federal commission would have done well to agree to accept the New York State Transit Commission's decision as final. The latter commission's findings might not be as equitable as those of a body like the Interstate Commerce Commission, farther removed from the influence of local conditions and opinion, but if our system of government is to succeed we must take the chance of making occasional errors in order to strengthen the hands of the local regulatory body.



Flint River Dam and power house with one tainter gate partially opened to show effect of stilling pool

Waterwheel Types Combined to Overcome Variations in Head and Flow

Power Plant on the Flint River in Crisp County, Ga., Employs Francis and Propeller-Type Turbines—Stilling Pool Destroys Energy of Overflow

BY THE combination of two different types of single-runner waterwheels in a hydro-electric development built by Crisp County on the Flint River in southern Georgia, it has been found possible to obtain efficient utilization at the large potential power in the stream at high-water stages and still get good efficiencies with the low and normal flows. This has been accomplished in spite of the fact that backwater reduces the net head to less than 20 ft. for a considerable part of the time.

The Flint River has a watershed of about 3,500 square miles above the site of the present development. The area drained is comparatively long and narrow. The topography of the upper and the middle reaches of the watershed is mainly red clay hills that are probably 30 to 40 per cent under cultivation. In the vicinity of the power house the land is low and swampy, with very little of it used for farming.

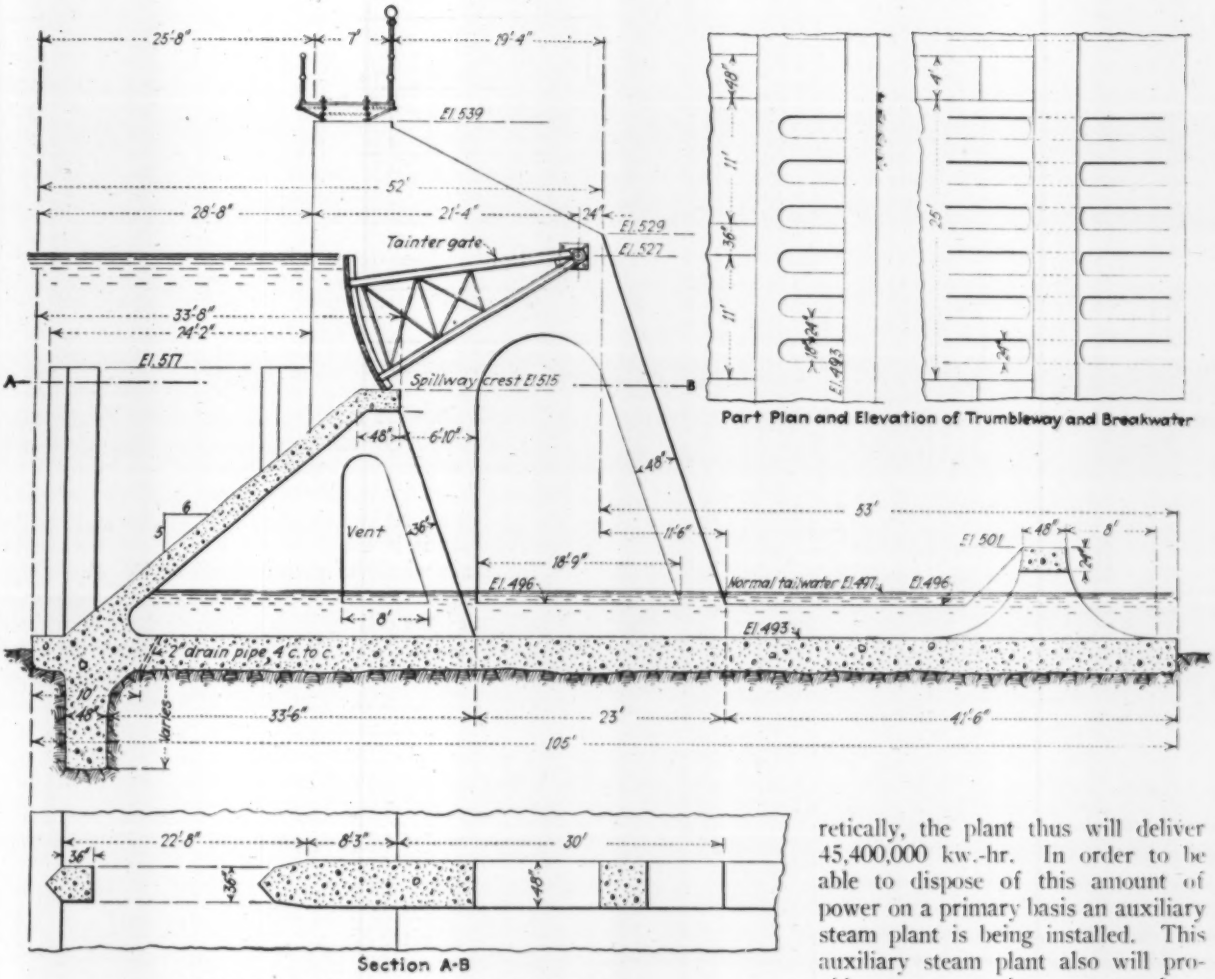
The stream is subject to wide variations of flow each year. At irregular intervals these annual variations reach great extremes. For example, a discharge of approximately 58,000 sec.-ft. was recorded in January, 1925, at the site of the project, while the low flow of record at that point is around 900 sec.-ft. On account of the flat slope of the stream the gage readings also show much difference, the maximum at this power site being 35.5 ft., while the minimum has been down to 1.1 ft. above the same datum.

Since the development of only 30 ft. of static head at the site was practicable with normal head and tail-water conditions, backwater presented a serious problem. Records over a period of thirteen years of what was selected as representing average conditions showed that for fifteen days each year the net head would be reduced to 15 ft. or less on account of backwater; for 40 days it was 20 ft. or less, and for 114 days 25 ft. or less. These figures also are coupled with the fact that not infrequently the net head varies from 12 to 15 ft. for a month or more at a stretch.

Given these conditions, which are typical of many streams of the coastal sections of the southeastern states, the generation of a large block of primary power by methods formerly in vogue was impossible, but the production of power by a combination of former methods with the newer developments in water-turbine design offered attractive possibilities. The combination of wheel designs used in this project utilizes both the Francis-type and the propeller-type turbine. The two types are installed as separate units, each driving a separate generator. The wheel-and-generator units may be operated independently or in synchronism, as desired.

The Francis-type turbines are designed to have their maximum efficiency under the static head of 30 ft. that is available at the site with normal head and tail-water. They also have high efficiencies with a drawdown of 5 ft. in the reservoir of the project.

The propeller-type wheels are designed for maximum efficiency under a net static head of 20 ft. They deliver their maximum rated capacity at good efficiencies at all ranges of head from 20 ft. down to 8 ft., although the matter of efficiency becomes of minor importance with the large amount of potential power available when high



DETAILS OF THE DAM AND STILLING POOL

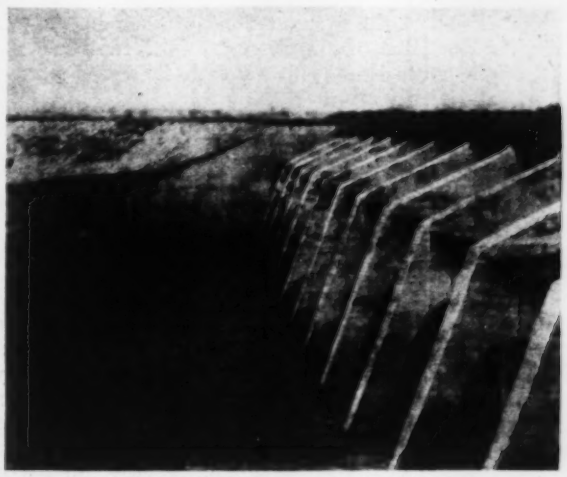
tail-water reduces the available net head to less than 20 ft.

An accompanying chart shows the rated efficiencies of the wheels under different loads and different operating conditions. From this it may be seen that for outputs between 1,400 and 10,000 hp. for the plant the average efficiency of the waterwheels is 87.5 percent under the normal static heads of the project, which are between 25 and 30 ft. Below 25 ft. head, due to high tail-water, the output of the plant may be readily maintained at the full rated capacity. The manner in which this obtains is illustrated in the accompanying diagram, showing the power-percentage-of-time curves and the streamflow and net-head curves.

Supplementing the balancing effect of the dual-wheel combination is an available storage of 35,000 acre-ft. in the reservoir of the project. With this storage the normal average low flow of the stream is increased from 1,085 to 1,800 sec.-ft. for from 80 to 100 per cent of the time.

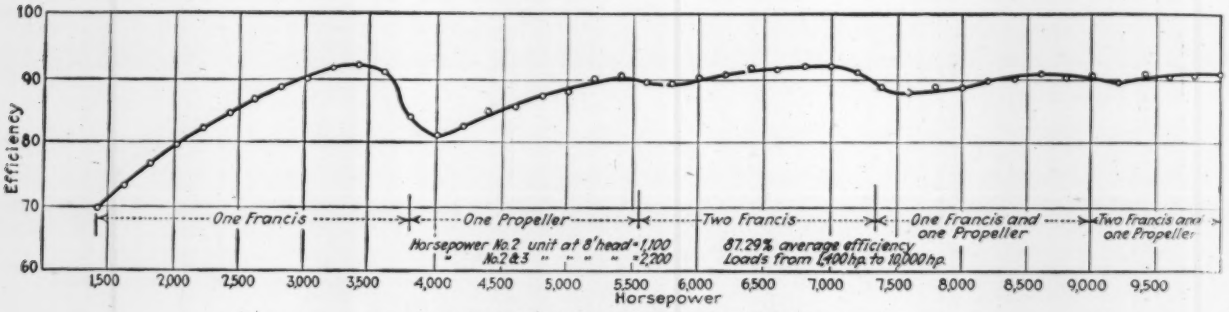
The two Francis-type turbines each are direct-connected to a 3,000-kva. generator. The two propeller-type wheels each drive a 4,500-kva. generator. With this equipment and the stream conditions as outlined, it is expected that 29,960,000 kw.-hr. of primary power may be generated. For 70 per cent of the time there will be an additional 5,700,000 kw.-hr.; for 60 per cent of the time another additional 4,700,000 kw.-hr.; and for half of the time a further additional 5,040,000 kw.-hr. Theoretically, the plant thus will deliver 45,400,000 kw.-hr. In order to be able to dispose of this amount of power on a primary basis an auxiliary steam plant is being installed. This auxiliary steam plant also will provide reserve capacity to meet unforeseen conditions.

The reservoir of the project is created by two puddled earthfill embankments, one 2,050 ft. and the other 700 ft. long. Between these embankments are the power house and a hollow-type concrete spillway, the latter containing twelve 25-ft. tainter gates. The pond provided by the

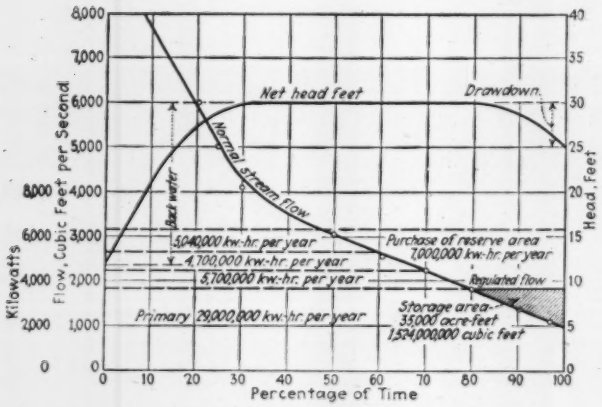


STILLING POOL BELOW THE DAM

The breakwater (left center) is partially submerged. The small quantity of water going over the dam is passing through the openings in the breakwater.


Efficiency
100
90
80
70
60
One Francis
One Propeller
Two Francis
One Francis and one Propeller
Two Francis and one Propeller
Horsepower No.2 unit at 8' head = 1,100
" No.2 & 3 " " " " = 2,200
87.29% average efficiency
Loads from 1,400 hp. to 10,000 hp.
1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 5,500 6,000 6,500 7,000 7,500 8,000 8,500 9,000 9,500
Horsepower

EFFICIENCY CURVES OF THE WATERWHEELS
The efficiency of each type is shown together with the possibilities through combination.



RELATION OF STREAMFLOW TO POWER OUTPUT

combination has a superficial area of 7,900 acres at the normal flow line, 30 ft. above the base of the spillway.

Good ledge limestone underlying the site provided satisfactory foundations for the power house and the spillway. A continuous reinforced-concrete slab, except for expansion joints, was laid on the limestone to distribute the load of the power house and the spillway. Special provisions were made to guard against flotation due to the unusually high tail-water.

The tainter gates each have a rated capacity of 4,850 sec.-ft. under a maximum head of 22 ft. over the crest of the spillway. Their combined capacity is thus 25 per cent in excess of the greatest flood of record. At this stage the flow line of the reservoir is 2 ft. below the crest of the earth dams, with a greatly increased storage slightly above that stage.

Experience has shown that some provision must be made to avoid a vacuum under a hollow dam created by large quantities of water passing over the crest. At the Flint River project this is accomplished by a continuous air passage through the buttresses of the dam, with connection at both ends to a shaft reaching well above the highest possible stage of water.

Dissipation of the great energy of the overflow of the spillway during flood stages of the stream had to be provided for in order to insure against scour of the limestone foundation. This has been done by a specially designed tumble bay or stilling pool built up on an apron on the downstream side of the spillway. This apron is continuous with the base of the latter, the two having a combined width of 105 ft. Near the downstream edge of the apron is a transverse breakwater wall, 8 ft. high, 4 ft. wide on top and with both faces having a curved surface on an 8-ft. radius. Through this wall on 4-ft. centers are openings, 2 ft. wide and 6 ft. high, with arched tops.

With this design of stilling pool, when there is enough water coming over the spillway to call for energy dissipation, the lower stratum of water passes through the openings in the breakwater wall. The discharge through these openings is in the form of a series of horizontal jets, which are wholly or partially submerged, depending on the volume of water over the spillway. At flood stages the balance of the discharge from the spillway is turned up by the breakwater and falls over the latter onto the jets through the openings. Between the breaking up in the pool of the spillway discharge and the effect of the jets through the breakwater wall, all danger from scour is eliminated. At River Falls, Ala., a stilling pool of this kind at a smaller development of the same type, but with a less satisfactory foundation, has given good results for some years.

The Flint River development is a public project financed by a bond issue of Crisp County. It will furnish power for domestic and industrial purposes in that county and vicinity. Emmet S. Killbrew, consulting engineer of Cordele, Ga., made the preliminary studies for the project, prepared the designs and supervised the construction. J. E. Sirrine & Company, of Greenville, S. C., were retained as consulting engineers.

East Bay District Decreases Tax Levy

Estimates of expenditures and revenues for the East Bay Municipal Utility District (supplying water to Oakland and neighboring cities on the east side of San Francisco Bay) indicate that the tax rate in the district for this purpose will be reduced from 50c. to 42c. per hundred dollars of valuation during the coming year. The financial estimate of the district during the coming tax year, according to G. C. Pardee, president, is outlined as follows:

Interest on $65,000,000 bonds at 5 per cent	$3,250,000
Operating expenses	$2,022,000
Estimated improvements, replacements, sinking fund, etc.	$2,488,000
Total expenditures	$7,760,000
Income from all sources	$5,510,000
Balance to be raised by taxes	$1,850,000

This balance will be taken care of by a tax levy of 42c. per hundred dollars of assessed valuation throughout the district, and it is predicted that the necessity for tax levies for this utility will continue to decrease annually from the maximum of 50c. levied last year. The present basic water rate for the district for small consumers, who constitute 97 per cent of the services, is 25.3c. per 100 cu.ft. with a 55c. monthly service charge for a §-in. meter.

Municipal Water Use in Arid and Semi-Arid Regions

Large Part of Supply Used on Lawns and Gardens in Many Cities—Wide Variations Found in Adjoining Towns

By N. T. Veatch, Jr.
Consulting Engineer, Kansas City, Mo.

IN DESIGNING water-works for cities of the arid and semi-arid regions, consideration must be given to the extensive use of water for irrigation and the long periods of dry weather and high temperature during which the use of water is maintained at a high level. The maximum demand on the distribution system usually occurs in the higher class residential sections, rather than in the business or industrial sections. The relative water demands at Evansville, Ind., in a humid region, and three cities in the arid and semi-arid region are shown in the accompanying table.

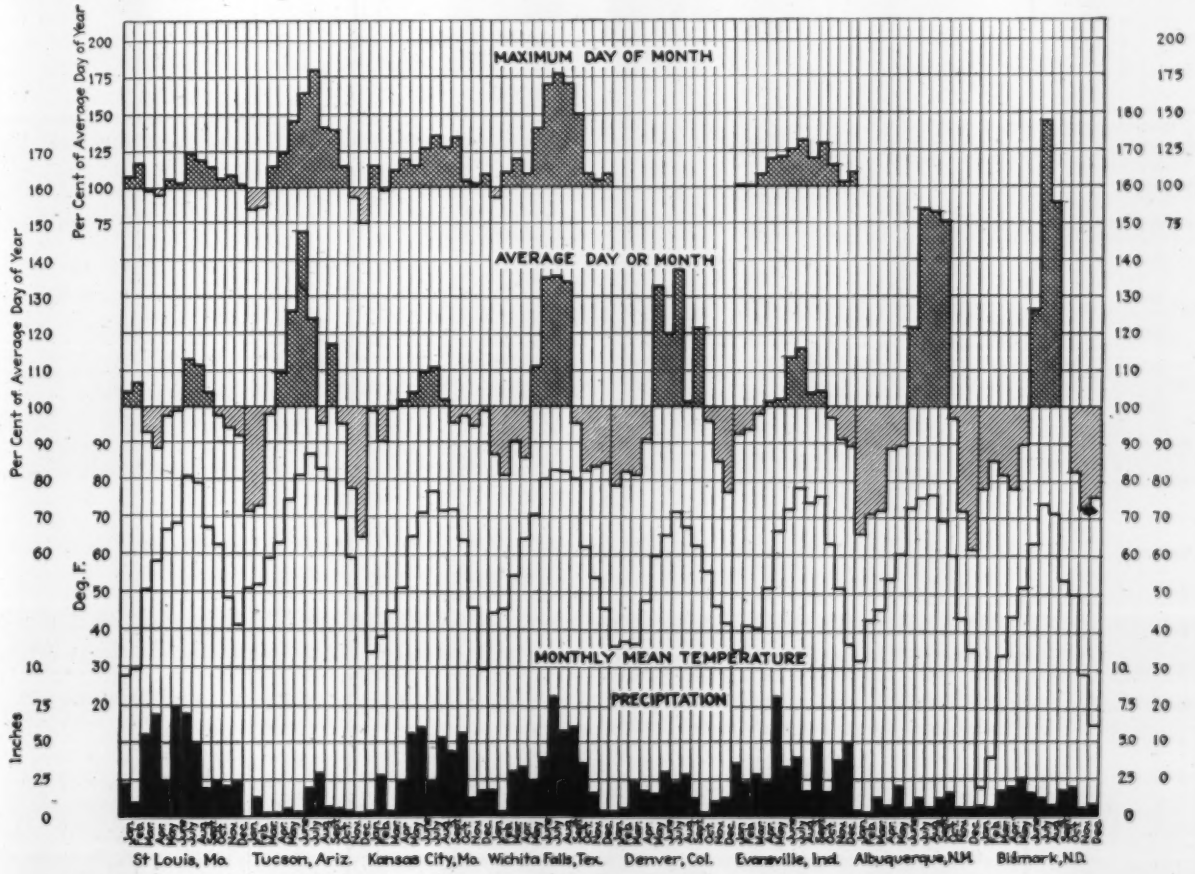
Strong contrast between demands in arid and humid sections is illustrated by the figures for Evansville and Tucson. When the data for these cities were collected both were served by direct pressure. Evansville was nearly 100 per cent metered and Tucson slightly over 80 per cent. The low ratio of maximum hour to maximum day at Tucson is due to the maximum demand extending over more hours per day and more days per month. The variation between minimum and maximum day at Tucson is from 3,000,000 gal. (3 m.g.d.) to something over 10 m.g.d., which is reflected in the ratio of maximum day to average day. In connection with an investigation at Tucson, Richard Bennett, superintendent of the water department, prepared scaled plats of some 30 tracts of land in the residential sections to determine the area of lawns and gardens actually irrigated and the quantity of water used for this purpose. The entire area of the city was then classified as to the use of water for irrigation. In those sections occupied by the better class residences it was found that approximately 38.5 per cent of the total area (including streets and alleys) is irrigated, and that the average quantity of water used during the maximum month is 30 gal. per 100 sq.ft. of lawn per day. In those sections occupied by average or middle class residences, the total area actually irrigated was about 17.5 per cent, and the quantity of water used approximately 10 gal. per 100 sq.ft. of lawn per day. For the whole city, comprising 4,281

WATER DEMAND IN FOUR CITIES HAVING DIFFERENT CLIMATOLOGICAL CONDITION

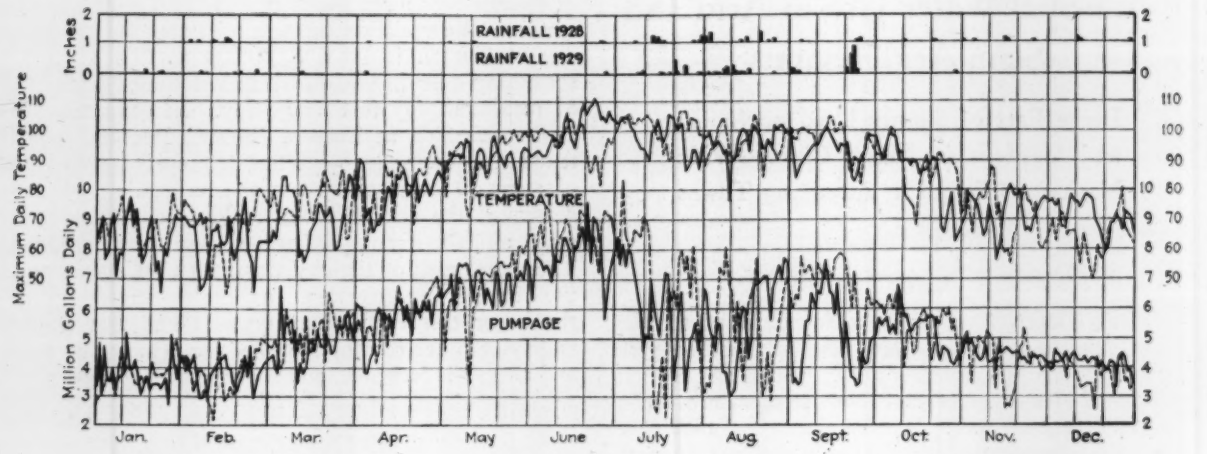
	Gallons per Tap			Percentage of Maximum		
	Average Day	Max. Day	Max. Hour	Day to Average Day	Hour to Average Day	Hour to Max. Day
Evansville	403	540	896	134	222	166
Tucson	916	1,623	2,220	177	225	137
Phoenix	884	1,402	2,386	159	270	170
Wichita Falls	327	578	1,085	177	333	188

Figures obtained during detailed studies of supply and distribution systems. Venturi meter records were available in most cases.

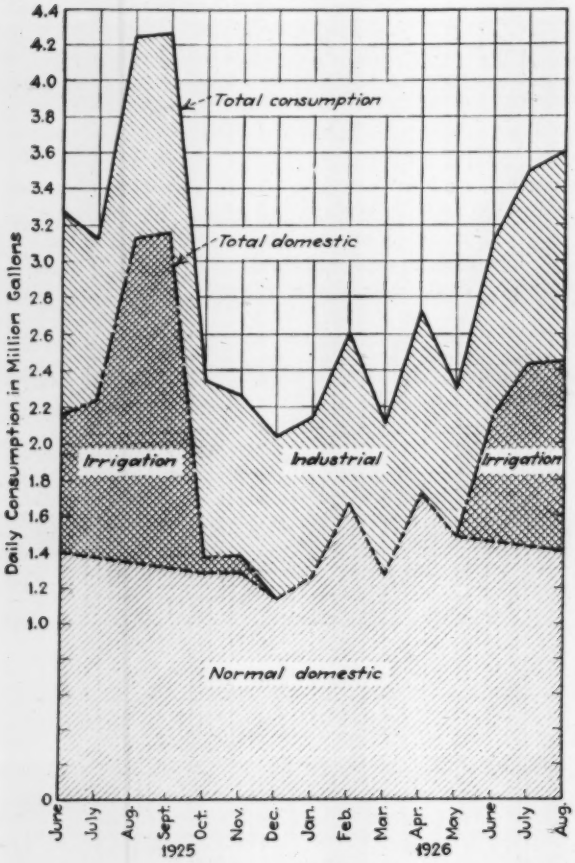
Abstract of a paper read before the American Water-Works Association in June, 1930.



RAINFALL, TEMPERATURE AND WATER CONSUMPTION IN EIGHT CITIES HAVING DIFFERENT CLIMATES



WATER PUMPAGE, RAINFALL AND TEMPERATURE AT TUCSON, ARIZ., IN 1928 AND 1929



EFFECT OF IRRIGATION ON WATER CONSUMPTION AT WICHITA FALLS, TEX.

acres, the net area irrigated at the higher average rate was 320 acres; at the lower average rate, 281 acres; while the balance, or 3,681 acres (including all streets and alleys), was not irrigated. The total quantity of water used for irrigation during the maximum month was about 5.5 m.g.d., which was some 64 per cent of the total pumpage; the average per capita use for irrigation was 151 gal. per day; for domestic and industrial uses, 84 g.d. The latter figure is to be compared with 101 g.d. average use for all purposes during the maximum month at Evansville.

A. H. Wood, superintendent of water-works, El Paso, Tex., reports that during the maximum month the quantity used for irrigation averages 46 per cent of the entire pumpage, and that the average use of water on lawns and gardens that are well maintained is approximately 30 gal. per 100 sq.ft. of area actually irrigated per day during the month of maximum consumption. This agrees with the figures for Tucson.

At Wichita Falls, Tex., the use of water for irrigation during the maximum month in 1926 averaged 58 per cent of the total pumpage, although the average per capita quantity so used was about 37 g.d. compared to 151 g.d. at Tucson.

A. H. Douglas, superintendent of the water department, Wichita Falls, has furnished data from ten selected consumers practicing extensive irrigation, and ten medium users. For the seven months of March to September, inclusive, 1929, the average use for irrigation purposes alone was 1.97 acre-ft. for the extensive users and 0.89 acre-ft. for medium users. As the growing season is largely covered by the period for which data are given, it would appear that an average figure of 2 acre-ft. would be ample to meet the irrigation demands. Wichita Falls is semi-arid, having an average annual rainfall of 28.59 in. The yearly rainfall varies from about 12 in. to 47 in. The monthly precipitation varies from 0 to 12 in. Out of 392 months of record available in 1926, only 22 had no rainfall. Therefore, the above figures on use of water for irrigation should not be used in more arid cities.

That other factors than aridity affect use of water for irrigation is shown by the fact that at Yuma, Ariz., practically none is so used, while at El Centro, Calif., only 30 miles from Yuma, approximately 40 per cent of the total pumpage is used for irrigation.

The "duty" of irrigation water used on lawns and gardens or the annual unit quantity required to maintain a lawn or to grow "grass" crops, bears some relation to the distribution of rainfall during the growing season. At Tucson, where the growing season extends for ten months of the year, with practically no rainfall during eight months of this time, well maintained lawns require approximately 84 in. of water per year. At Wichita Falls, where the growing season is eight months, the rainfall is normally quite well distributed through these months, and only 24 in. of additional water is required for well maintained lawns.

At Bisbee, Ariz., a city of 18,000 population, an unusual situation exists, in that a city in an arid section with an annual average rainfall of approximately 18 in., has a per capita consumption of only 30 gal. per day. In reply to inquiry as to the reasons for such a situation, I. A. Rosok, manager of the Arizona Edison Co., states:

> We pump our water 9 miles against an elevation of over 1,000 ft. and a total head of about 600 lb. per square inch. Consequently, our water rate is very high, which means that people have to economize on the quantity used. As this is a mining community, built in among the mountains, we have very few lawns and gardens and scarcely any water is used for irrigation.
>
> We note that you think that the population (29.1 per acre) is very dense for an Arizona city. The reason for this is that Bisbee originally started among the mountains in a very narrow canyon, and as the city grew it became necessary to crowd houses very close together in order to find enough space for the houses required.

As a contrast with Bisbee can be cited the situation that existed at Laramie, Wyo., several years ago. At the time of the investigation, there was no direct charge whatever for water, and the consumption was approximately 400 gal. per capita. These extremes are good examples of reasons why mass data on water consumption, unless detailed studies are made, are not to be relied upon for definite assumptions.

Steel H-Beam Piles for Ocean Pier to Submarine Oil Wells

Weight Against Flotation Combined With Ability to Penetrate Hard Bottom Lead to the Adoption of H-Beams for Ocean Pier

By C. L. Roberts
Robinson-Roberts Co., Los Angeles, Calif.

WEIGHT against flotation combined with bending strength, small wave exposure, ease of protection and ability to penetrate hard bottom lead to the adoption of H-beams as piles for an 1,800-ft. ocean pier recently constructed at Seacliff near Santa Barbara, Calif. As shown by the accompanying view, the structure is simple, consisting of four-pile bents capped and carrying stringers and decking. The bents are spaced 15½ ft. on centers, and the piles are braced both ways. The main pier is 22 ft. wide; at the sea end an outer dock structure 77x200 ft. provides for the oil-well derrick and its appurtenances, which are carried on four cylinder piers.

Design Requirements—Piers on open sand shores fail ordinarily by flotation. The heavy pounding surf puts the sand into suspension around the piling, and a heavy groundswell gets beneath the deck and lifts the structure from its seat. This has happened many times along the southern California coast. At the location of the pier described, the floor of the ocean under the sand is shale which ranges in hardness from a mudlike substance to rock. In the ordinary sense it is impenetrable. Blasting to secure penetration reduces the holding power so that the piling will not resist the uplift.

The design conditions to be met were these: The pier approach to the derrick and drilling operation had to be strong enough to resist the continual pounding of the seas and to carry as a viaduct large truck- and trailer-loads of drilling equipment. The bracing had to be of such character and so placed that it would present the least possible impact area to the seas. The derrick foundation had to be designed to carry the tremendous weight of modern rotary drilling equipment and so necessarily be independent of the pier structure.

FIG. 1—PIER ON H-SECTION STEEL PILES TO SUBMARINE OIL WELL

FIG. 2—PIERHEAD WITH OIL-WELL DERRICK IN POSITION

Pier Structure—An H-column section promised a pile having both weight to resist uplift and ability to penetrate the shale bottom. This section also comes nearest to a round pile in lateral strength. Steel H-columns were therefore adopted for piles—an 8-in. section for the shore end and a 10-in. section for the sea end. The piles, as shown by Fig. 1, were arranged in bents of four. The bracing above water consisted of horizontal frames of angles welded to the piles and of longitudinal X-bracing of rods. Each bent was capped by a 12x12-in. timber bolted to steel cap plates which were welded to the pile tops. Timber stringers and decking, with wheel guards and railings, completed the structure. The roadway was 22 ft. Fig. 2 gives an idea of the deck structure.

Driving H-Piles—As no room was available for storage and working operations on the beach, a timber false-

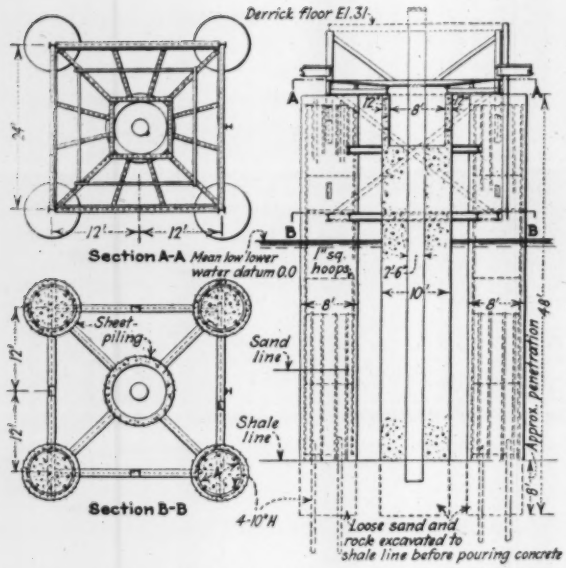


FIG. 3—FOUNDATIONS FOR OIL-WELL DERRICK

work was first carried outshore and the piledriver rolled onto it to start the pier building. The driving was done with a regulation steam hammer, using an anvil block and a retainer to hold the pile in place. Before driving, the piles were cleaned of mill scale, given a priming coat and then painted with bituminous enamel. Careful protection of this coating was exercised during handling and driving. It was possible at times to drive three bents (twelve piles) in eight hours, but the average was nearer two bents. As fast as pairs of bents were available temporary timber crossframes were fastened to them to serve as staging for cutting off the pile tops and welding on the permanent cap plates. The cutoff was made by acetyline torches, and the welding was done by electricity.

Oil-Derrick Foundations—The oil-well derrick foundation was a separate and peculiar problem, and the design adopted has been patented. Water depths were from 25 to 30 ft., varying with the groundswell, winds and currents. The top of the substructure, as shown by Fig. 3, was about 31 ft. above mean low water. With a derrick tower 120 ft. high there was, therefore, a nice problem in overturning moment to be considered. Lateral support by guying was impracticable, as the cost of dolphins sufficiently well constructed to withstand the seas would be prohibitive. The derrick with its rigging, drill pipe, headblocks, etc., had to be self-contained with its foundations.

A foundation of five cylinder piers, as shown by Fig. 3, was adopted, a pier for each derrick leg and a center pier serving the dual purpose of a drill well and as a support for the drilling table. While drilling, the leg piers take all the weight, and when drilling is stopped and the drill is being taken from the hole the load is transferred to the center pier.

In building the piers steel sheetpiles were driven to form cylinders in which the concrete and its reinforcing structure were placed. The problem was to put down the sheeting so that it would stand against the groundswell and surges. The first operation was to drive a steel H-pile at the center of the pier. On this were hung two circles of timber segments, one at about water level and the other about 12 ft. higher. With these guides four H-piles were driven at the quadrants of the circle. These piles were tied together by an outside hoop of angles welded to the piles and carried a circular guide for meshing and driving a ring of sheetpiles. The sand was dredged from inside the cylinder down to the shale bottom, and then the reinforcing cage was set and the cylinder filled with tremie concrete.

The time limit for building the pier was 180 days, and the work was finished two months ahead of schedule. The design was suggested by the author. The Robinson-Roberts Co., Los Angeles, Calif., built the pier under the supervision of W. H. Richardson, engineer, General Petroleum Co.

Steel H-Beam Piles Used to Support Highway Bridges

H-Sections in Gravel Have 30-Ton Capacity—Welded Crossbracing Completes the Trestle Bents

By W. E. Emmett

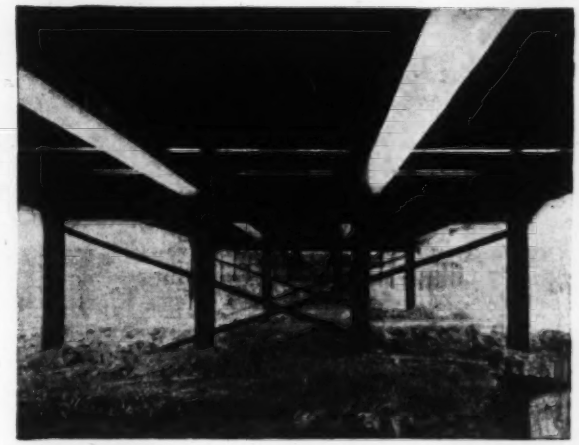
District Engineer, American Institute of Steel Construction, San Francisco, Calif.

STEEL bearing piles were used to support two highway bridges recently built in Monterey, Calif., for what is believed to be the first installation of this kind in the Far West. The structures consist of four-pile bents, spaced 40 ft., supporting steel stringers carrying an 8½-in. concrete floorslab. Two bridges were built, one of seven panels and the other four, for a total cost of $27,689, including floorslab and railing. The type of construction was selected for its economy and adaptability to the particular conditions. At another location, in Sacramento County, steel H-section piles were substituted for wood piles under a pivot pier when the wood piles broomed badly.

The design features of the steel-pile trestle bents are comparatively simple and interest centers largely in the use of the steel bearing piles. These consist of 8-in. 32-lb. structural-steel H-sections with a copper content of 0.20 to 0.23 per cent. The piles were driven with a 2,400-lb. drop hammer and were required to develop a bearing capacity of 30 tons, as determined by the *Engineering News* formula. During driving, a steel cap was used to protect the top of the pile. Penetration averaged 18 to 21 ft. through sand and gravel formation. The piles were required to be painted a shop coat of red lead and a field coat of graphite two days before driving, followed after driving by a second field coat of graphite on the exposed length.

When driven, the piles were cut off with a torch and the bents were completed by the addition of structural-steel caps and diagonal bracing of 3x3-in. angles temporarily bolted and finally welded in position. The cap is formed of two 8-in. channels bolted to the flanges at the tops of the piles. As an additional support for the bearing plate, which rests on top of the pile, two short angles were bolted to the web, which is in the longitudinal direction of the bridge. At each pile the two channels forming the cap and the two angles support a 1-in. bearing plate on which rests the ends of the stringers.

Four lines of stringers, 110-lb. 30-in. I-beams, extend over the lines of piles and form the support for the



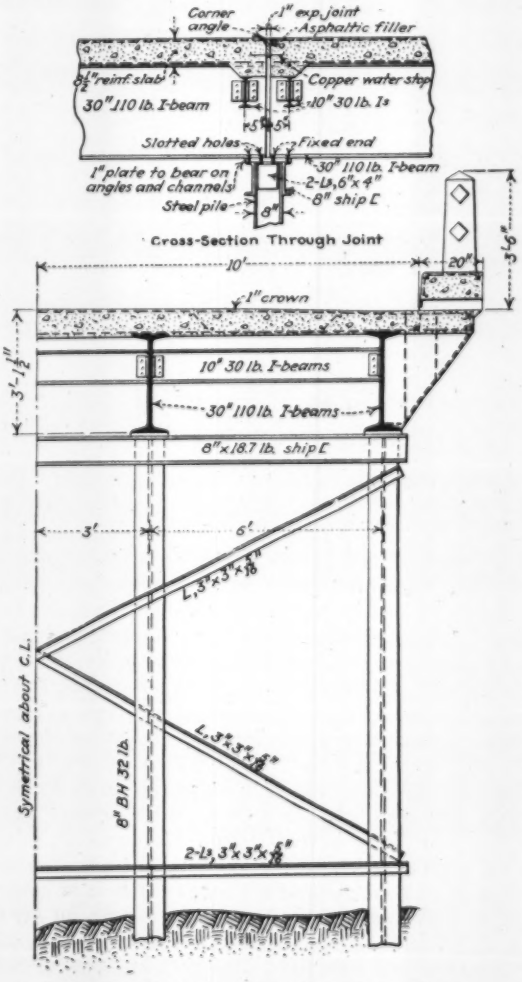
STEEL PILES AND STRINGERS WITH SLAB FLOOR
Piles driven to 30-ton bearing in panel and cut off by torch.

floor. One end of each of the stringers which span the 40 ft. between bents is fixed by bolting it to the bearing plate; the other end has slotted holes in the bottom flange to provide for expansion. At third points in the 40-ft. spans, 10-in. 21-lb. I-beams extend between stringers near the bottom flange to provide lateral support. At the ends and midpoint of each span, a reinforced-concrete bracket provides for supporting the curb and railing beyond the side stringers. These features outline the general design of the steel substructure upon which an 8½-in. concrete floorslab was placed, together with a concrete curb and railing.

Abutments and wing walls are formed of similar piles, incased in a 16-in. thickness of concrete.

The two structures were built under a single contract, involving eleven 40-ft. spans, four abutment structures and the required slab and railing. The three lowest bids ranged from $27,689 to $33,758. The base price of steel was about $2.70 per 100 lb. at King City, with a haul of 9 miles to the bridge site. The bridges were designed for standard H-15 loading as required by the Bureau of Public Roads. Plans for the two bridges were prepared by H. F. Cozzens, county engineer of Monterey, Calif.

The bridge in Sacramento County is over the American River. The original design for the foundation of the pivot pier of a swing span was based on using wood piles costing 45c. per foot in place, the contractor to receive pay below the cutoff, which was to be 30 ft. below water level. Penetration was to be 30 ft. through a sand and gravel formation. After a penetration of 9 ft., the piles broomed badly. Setting in dredged holes was tried without success. Inasmuch as it was doubtful if a foundation with only a 9-ft. penetration would be safe, the county engineer, Charles Deterding, made an agreement with the contractor whereby he would receive 90c. per foot for 8-in. 32-lb. H-sections of copper-bearing steel. Only half as many steel as wood piles was required, since 30 ft. of penetration developed about 35 tons capacity. Also, the contractor was able to use a follower for the steel piles, permitting the purchase of 30-ft. lengths instead of 60-ft. lengths, as was required with the wood piles.



ESSENTIAL ELEMENTS OF STRUCTURE

Wood Preservation Increases Steadily

CONTINUAL increase in the use of timber treated by preservative processes is indicated by the annual statistics for 1929, as prepared by R. K. Helpenstine, Jr., for the U. S. Forest Service and the American Wood Preservers Association. A total of 362,009,047 cu.ft. of timber was treated, an increase of nearly 8 per cent over 1928, and 90 per cent was treated by pressure processes. Of 203 plants in operation (ten more than in 1928), 131 were of the pressure type, 56 non-pressure (open tank) and 16 equipped for both processes. In eight classes of material, the greatest increase over 1928 was 104 per cent for wood block flooring, while wood block paving decreased 47 per cent and switch ties decreased 0.8 per cent. These materials are as follows: railway ties, 71,023,103 (increased 1.3 per cent); bridge and construction timbers, 377,089,099 ft. b.m. (11.6 per cent); poles, 4,383,768 (10.9 per cent); crossarms, 3,158,166 (62.1 per cent); wood block flooring, 22,699,782 sq.yd. (104.4 per cent); wood block paving, 88,137 sq.yd. (decrease 47.1 per cent); piles, 25,324,255 lin.ft. (25.3 per cent.)

Creosote consumed in this industry aggregated 226,374,227 gal., of which about 60 per cent was of domestic production. The amount of zinc chloride was only 19,848,813 lb., a decrease of about 16 per cent. But there were also 1,188,148 lb. of miscellaneous salts and 38,410 gal. of miscellaneous liquids. Railway ties constitute the major portion of the wood treated.

Working Directions and Data for Hydraulic-Dredge Operation

Methods and Average Figures for Extending Pontoon Line, Shifting Swing Cables, Removing Obstructions From Pump, Relining Pump, Changing Cutters and Moving Dredge—Discharge Line Practice and Control of Fill

By O. P. Erickson
Engineer, Great Lakes Dredge and Dock Co., Chicago, Ill.

THE FIELD of the hydraulic dredge is limited only by the material to be excavated and the availability of disposal areas within economic pumping distance. The modern hydraulic dredge can handle any material up to and including some of the softer grades of rock. Suitable disposal areas within an economic pumping distance are becoming more and more difficult to obtain near the large industrial centers. In these localities, therefore, the hydraulic dredge is being slowly replaced by the self-loading hopper dredge or by dipper and clamshell dredges with dump scows. There are, however, occasions when the hydraulic dredge may be used to advantage in pumping into dump scows, as when dredging a channel through solid land. A recent application of this method on the Chicago River straightening project was described in *Engineering News-Record*, May 2, 1929, p. 717.

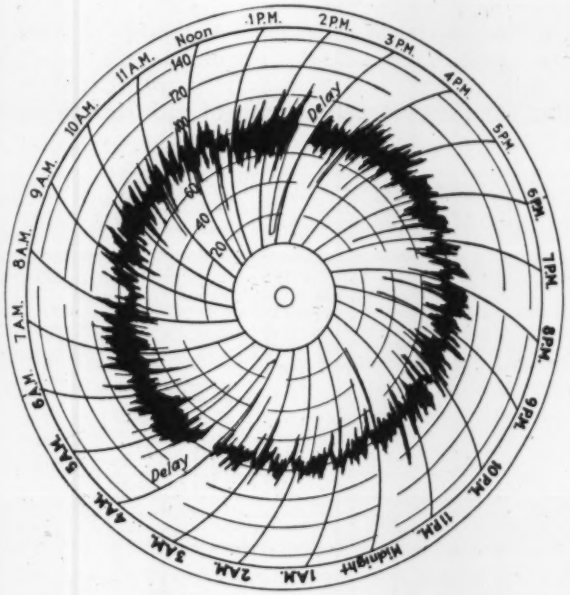
Preliminary Plans and Operations

Besides a general plan of the project, good dredging practice calls for a thorough examination by borings of the area to be dredged, samples of the various materials and the estimated yardage of each class. A thorough study is required of what section or cuts are to be dredged first, the most suitable width of the cuts for the dredge to be used, the depth of water, the current conditions and the interference to pontoon line from passing boats. This last condition will decide whether a floating pontoon line or a submerged pipe line is to be used. The most efficient layout of the shore pipe lines, the estimated yardage and class of material each line has to handle, the levees or bulkheads and the spillways required must be carefully gone into. All of the above data and layouts are plotted on the general plan of the project for ready reference and guidance in scheduling the work.

The length of pipe line, class of material, depth and evenness of fill and time allowance are usually the deciding factors in selecting a dredge. Generally speaking, the 27- to 30-in. dredge, with 2,500 to 3,000 hp. or more on the main pump, is best suited for pipe lines over 4,000 ft. and fill depths over 10 ft. With pipe lines less than 4,000 ft. and fill depths less than 10 ft., the 15- to 24-in. dredge can do the work more economically than the larger machines.

The dredge usually has to be brought from some other locality. While this is being done the contractor puts up the necessary ranges and ships in the shore pipe and pontoons. Shore gangs lay the shore pipe lines and build the levees and spillways; another force assembles the pontoon line, so as to have it ready by the time the dredge arrives. Sometimes trestles for carrying part of the shore pipe line, or a submersible pipe line instead of the trestle, are required and must of course be built before the dredge gets on the job.

Hydraulic dredges usually operate 24 hours a day and quite often seven days a week. As the eight-hour day is used with few exceptions, this means three shifts or watches. On the day watch there are usually on the larger dredges a deck captain, operator, engineer, machinist, blacksmith, carpenter, oiler, wiper, fireman, and two to five deck hands. Each night watch consists of an operator, engineer, mate, oiler, fireman and two or three deck hands. On diesel and diesel-electric dredges the fireman is eliminated, but the larger electric dredges carry from one to three electricians.



TYPICAL PRESSURE-RECORDING CHART FOR 30-IN. DREDGE

This particular graph was produced while pumping through 10,000 ft. of pipe line. A similar form of chart records suction vacuum.

Extra Watch Duty Advantageous—Calling out men from the other watches for assistance in moving the dredge and pipe line, adding pontoons, relining pump, or in fact whenever the delay time of the dredge can be shortened by doing several jobs simultaneously, is considered good practice. The time gained by having three or four additional men on the job, even if it is only for 10 min., will on a 24- to 30-in. dredge, with an earning capacity of say $120 per operating hour, earn $20, while the time of the men will amount to about $2. On dredges where additional men are called out there are

usually two or three men less than on dredges where this is not done. Ordinarily the men like this opportunity of making extra money. A bonus plan is used by some of the large dredging companies, whereby the men earn as much as 50 per cent of their salary in bonuses. This gives the men an extra incentive to work and makes everyone eager to reduce delays and get the highest possible output.

Skilled Superintendence Required—The superintendent and chief engineer are usually on duty during the daytime and are subject to call night and day. The chief engineer is in charge of the engine room and is responsible for the efficient operation of the dredge power plant. The superintendent usually has charge of the dredge and the pontoon and shore pipe lines as a whole. He is responsible for the continuous and efficient operation of the dredge. In order to plan the work ahead correctly and to be prepared for the different emergencies that arise almost daily, it is important that he should be a man with plenty of foresight, common sense and practical engineering experience. He must be able to obtain from his operators the greatest output possible from the dredge, to reduce the time of the unavoidable delays to a minimum and to avoid unnecessary delays.

Operating Procedure to Reduce Delays

Continuous operation requires close management of the necessary plant shifts and changes which the progress of the work requires. The most frequent delays to continuous operation are for adding or removing sections of floating pontoon line. Except in the few instances where the dredge is discharging from the end of a floating pontoon line, the pontoon line is connected to a fixed shore line and as the dredge moves ahead the line becomes tight and a section or sections must be added to extend it. How often this has to be done depends on the yardage in the cut, the capacity of the dredge and how much the pipe line can be extended each time.

Pontoons may have to be added sometimes as often as six times in 24 hours and at other times only once in 48 hours. The time required varies with the size of the pipe line, the kind of ball joints used, the training of the men doing the job and the equipment they have for doing it. The time required for adding a 50-ft. 20-in. pontoon section under average conditions is not over 10 to 15 min., and for a 50-ft. 30-in. pontoon section not over 25 to 40 min.

Swing Cables and Spud Cables—The swing cables sometimes have to be shifted ahead several times in eight hours, depending on the distance of the swing anchors or the objects to which the swing cables are made fast and the advance of the dredge in the cut. Usually, if the water is fairly deep, say 12 to 15 ft., the launch or dredge tender has power enough to hook onto the cable and drag the anchor ahead the proper distance. The dredge digs until the tender is ready to pull the anchor loose from the bottom; it may then pump water, if the fill permits it, while the tug is moving the anchor ahead. Under favorable conditions this does not require over 5 to 10 min. Often the swing cables are run out at high tide over tidal flats, and in such cases a floating derrick, towed by a shallow-draft launch, is used to lift the anchor off the bottom; this operation usually requires from 20 to 40 min. per anchor. The ends of the swing cables may be shackled to deadmen on shore, to dock timbers and to trees on the canal or riverbank, in which case the cables may be shifted in 5 to 15 min.

The dredge operator regards two details as important: first, he shifts the cables before they get too far behind, as this delays the quick swinging of the dredge and throws heavy strains on the cables and spuds; second, he does not shift the cables too far ahead, as this makes it difficult or impossible to swing over sufficiently to clean up the sides of the cut, and the cables may foul the cutter, resulting in a damaged or cut cable.

Cable breakage can be largely avoided by a periodical examination for indication of serious wear. When this is apparent the cables are renewed at the first possible opportunity without delay to the operation of the dredge. The time required to change a swing cable depends on the physical conditions and on the training of the crew. Two hours is perhaps a close average. Renewing a spud cable requires about two hours on the 24- to 30-in. dredges. One or two spare swing cables are usually carried on hand, also one spare spud cable, so that delays will not be occasioned by having to make up cables at the last minute.

ROCKS AND OLD PILE HEADS TAKEN FROM 30-IN. PUMP

Obstructions in the Main Pump—Pump obstructions are usully noted by a drop in the suction vacuum and discharge pressure. The obstruction may sometimes drop out when the pump is stopped, or it can be knocked loose from between the impeller vanes by a bar through a hole, which is provided in the top of the pump casing on most modern dredges. In either case the obstruction may or may not pass through the impeller. The surest method of getting rid of it is to open the manhole on the suction pipe at the pump. This requires around 10 min. on the smaller and 20 min. on the larger dredges. As this may have to be done on occasions several times per hour, means are provided for quickly draining the discharge pipe. The one most used is a swing-gate check valve on the discharge near the stern of the dredge or on the first pontoon next to the dredge. A gate valve on the discharge pipe near the stern of the dredge is also used.

Dredges having the suction pipe below the water line often have a gate valve installed in the pipe close to the front bulkhead, so that the suction pipe can be closed off if required. A valve on the suction pipe very often gives considerable trouble from leaking when shut off, also it

is difficult to keep the stuffing boxes and flanges from air leakage, which decreases the vacuum carried on the pump. For these reasons, instead of having a valve in the suction pipe, a number of prominent dredge contractors have the pipe installed above the water line of the dredge.

Moving Dredge—Moving the dredge from one location to another on the job occurs quite frequently, and in order to make this delay as short as possible all the different phases of the operation are carefully planned. Full consideration is given to high or low tide, current and wind velocity, boats available for handling the dredge and pipe line, and the men available, as well as the necessary ranges for direction and location of cut. The time required for moving depends on so many conditions that it may be anything from 1 to 24 hours, or even longer.

Relining the Pump—The frequency of pump relining depends on the material and the density of the mixture pumped and on the velocity through the pump. Sharp sand with high velocity and density will wear out a set of pump liners in ten to fifteen days, whereas in soft mud and silt these liners will last for years. The time required for relining a well-designed 24-in. pump should not be over ten hours and for a 30-in. pump not over fifteen hours on an average.

Changing Cutters—How often cutters will have to be changed depends on the abrasiveness of the material and the peripheral speed of the cutter. Next to rock, hard clay mixed with gravel and sharp sand and shell is the most abrasive material. Cutter blades in these materials last ten to fourteen days, while in mud and clay they may last for years. An extra cutter is usually kept on hand for replacement. Changing cutters on a 20-in. dredge, when the cutter screws onto the shaft, requires about an hour, and on a 30-in. dredge about two hours. With the cutter keyed onto the shaft it requires about three hours for a 20-in. and five hours for a 30-in. dredge. Screwing the cutter onto the shaft is preferred to keying for this reason, and also because the screw connection is more dependable.

Pipe Line and Fill Practice

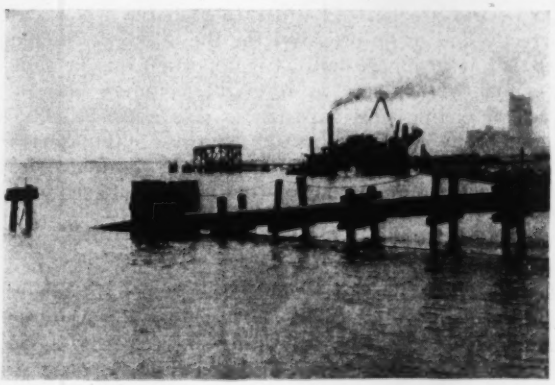
Both water and land discharge pipe lines are required in most hydraulic-dredging operations, and their construction and shifting and the management of the fill are operations that call for skill.

Pontoon and Submerged Pipe Lines—Floating pontoon lines of 3,000 ft. and more, with can-type pontoon tanks, are sometimes used, but the average length for 24- to 30-in. dredges is between 1,200 and 1,500 ft. Generally, 500- to 1,000-lb. anchors with 400 to 1,000 ft. of $\frac{5}{8}$- to $\frac{7}{8}$-in. cable per anchor are used. The distance between anchors may be 200 ft. in locations with strong current and wind conditions, but on the average is about 400 ft. The winches for holding the anchor cables are ordinarily double-geared hand-crab machines capable of a line pull of 5,000 lb. with two men.

A 90-deg. elbow is generally used in the pontoon line to deflect the line to the shore or the side of the cut. Pontoons are usually added to the line between the elbow and the dredge. The elbow pontoon usually has a 1,000- to 1,500-lb. anchor with $\frac{3}{4}$- to 1-in. cable 600 to 1,200 ft. long, leading to a double-geared winch with a line pull of about 8,000 lb. with two men. Ordinarily, some of these anchors have to be moved ahead every day, depending on the advance of the dredge during the 24 hours.

It is now almost standard practice to have limit cables between pontoons. By keeping these properly adjusted a great many unnecessary delays as well as the expense of replacing broken bolts or ball joints can be avoided. These cables, depending on the size of the pontoon line, are from 1- to $1\frac{1}{2}$-in. plow-steel wire rope.

CONNECTING SECTIONS OF PIPE LINE FOR SUBMERSION



SUBMERGED PIPE LINE RISING TO SHORE CONNECTION

The most suitable time for adding pontoons depends on the pipe line, tide and wind conditions. The pontoons are placed in the proper location; the launch or tug, if one is used, stands by, and all the necessary tools required are on hand before the dredge shuts down. Water may be pumped for a few minutes before shutting down, depending on the length of line and the material pumped.

When towing the can-type pontoon line for any distance the sections are placed with the cans end to end, connected to each other by wire cables and spaced from 5 to 40 ft. apart. Pontoon-line tows so arranged have often been made over long stretches of open water. In locations where the dredge is working in open water and has to pull to shelter during storms, a pontoon section 100 ft. long, with the cans parallel to the pipe or with semi-circular tanks under the pipe, is preferable to the can-type of pontoon, as it is less affected by wave action. There is an advantage also, because these pontoon sections are not disconnected but are towed into port as units about 800 to 1,000 ft. in length.

The use of the submersible pipe line has come greatly into favor in the last few years. It is not affected by wind, wave or current action, as is the floating pontoon line. It can be moved from one location on the job to another almost as quickly as the pontoon line. On tidal flats this type of line can be floated into place on high tide and used instead of a costly floating pontoon line or an expensive trestled shore line. In busy harbors the

submerged pipe line eliminates interruptions to the dredging operations from passing boats. The length between ball joints varies with the conditions of the bottom; 150 ft. is perhaps the average.

Shore-Line Operation—Fills may be considered deep or shallow depending on how often pipe has to be added to the pipe line. Generally, where pipe has to be added an average of every 20 min. the fill may be classified as shallow. That is, the fill depth will vary with the output of the dredge and the material pumped. Usually a fill is considered level where a maximum allowable difference in elevation is between 1 and 2 ft. In order to keep a 24- to 30-in. high-powered dredge operating continuously on this depth and evenness of fill without delays from adding shore pipe, three to four branch pipe lines are required.

A trained gang of four to eight men, depending on the size of the dredge and material handled, is always busy adding pipe to the ends of the different lines, while another force rolls the pipe up to the ends of the line. A third gang is breaking up old pipe lines on the finished portions of the fill. A fourth gang is laying new pipe lines. Other gangs may be working on the spillways and levees. All breaking of pipe lines and transporting of pipe up to the end of the pipe lines is done as much as possible in the daytime, so that the night gang will only have to go from one line to another and add pipe.

Recently, two improved types of shore-line valve have come into use; both of them can be changed successfully when pumping. One is the Cushing cast-steel combination Y-valve used by the Great Lakes Dredge & Dock Co., Chicago, Ill., and the other is a combination Y-valve manufactured by the Lancaster Iron Works, Lancaster, Pa. Both of these valves, as the name implies, have the valves incorporated in the Y, thereby eliminating the two separate valves otherwise required. They have proved a distinct improvement both for handling and operating purposes over the present Y's and valves.

It is considered good practice with the present-day high-powered dredges to have lugs for holding the shore pipe sections together with bolts or cables to prevent the line from blowing apart during slugs in the line or in case the line should plug near the end. The lugs also give the shore gang something to catch hold of, thereby increasing the speed of handling the pipe.

By using light dragline machines, the men required for breaking and laying pipe lines can be reduced to the dragline operator and two men for handling the pipe. Also the lines can be broken and laid much faster. For breaking up plugged pipe lines these machines with one man can do as much as 30 or 40 men can do with shovels digging the pipe out. The average dragline as constructed today, however, is not suitable for the softer types of fill because of its weight, and therefore on the jobs where it is really required it cannot be used at all except with mats, which makes it cumbersome and slow.

An ideal machine for a fill would be one that could travel under its own power and lift a 2,000-lb. load at 20- to 30-ft. radius to a height of about 16 ft. above the ground, swing this load 360 deg. and not develop a ground pressure of more than 2 lb. per square inch. This machine should be able to travel at the rate of four miles per hour over the above kind of ground and should require only one man to operate. This type would, it is believed, find a ready market with all the larger dredging companies.

Levees for retaining the fill are usually built by dragline machines working on mats when necessary. They can build levees a great deal better and cheaper than can be constructed by hand. Flashboards are used to a considerable extent for retaining and building up a high fill. They, however, require a great deal of handling, and great care must be taken in keeping them tight and properly braced, particularly when used on a sandfill. Canvas is also used for building up sandfills somewhat on the order of the flashboard, but this practice is open to the same objections.

Spillways, particularly on sand and mudfills, are carefully constructed, and it is always best to be on the safe side regarding width and strength of construction. Generally, for 20-in. dredges with a 20-ft. velocity, a spillway 15 to 20 ft. wide is necessary; for a 30-in. dredge with 20-ft. velocity a 30- to 40-ft. width is required.

Performance

The performance of the present-day hydraulic dredge is usually based on so many yards per hour or per 24-hour day. The contractor expects and usually obtains 20 to 22 hours per day operating time, or between 600 to 660 hours per month when operating Sundays, except on exposed locations where the dredges have to pull into harbor during storms. The output of the different size dredges depends on the length of pipe line, the brake-horsepower of the dredge and the class of material handled. Generally, in pumping sand the 1,200-hp. 20-in. dredge will handle 1,000 cu.yd. per hour through 2,000 to 3,000 ft. of pipe line. The 2,000-hp. 24-in. dredge will handle 1,400 yd. per hour through 4,000 to 5,000 ft. of pipe line. The 3,000-hp. 30-in. dredge will handle about 2,000 yd. per hour through 5,000 to 6,000 ft. of pipe line, with an average velocity between 16 and 18 ft. per second. Much higher outputs than this are often obtained in pumping sand and mud; in pumping hard clay the above output is cut to about one-third, and pumping gravel may cut it to about one-fourth. That is, in pumping sand through 5,000 ft. of line, the 24-in. dredge will handle about 30,000 cu.yd. in 22 hours, pumping clay it will handle about 10,000 yd. and pumping gravel about 7,500 yd.

English Crane Accidents and Rules

Accidents to cranes and derricks on building work in this country have been serious at times, but in England they have occurred so frequently that the government, through its factory bureau, has undertaken to amend the building regulations law by inserting stringent requirements as to cranes and hoists of all kinds. These amendments have been discussed with contractors, workmen and crane manufacturers. As now drafted they require every crane, with its anchorage, to be inspected every week by a competent person, who reports his findings in prescribed form for record. Every crane built after June, 1931, is to conform to specified standards and no crane of earlier date is to be used after June, 1935, unless it has been changed to conform to these standards. Further, cranes having timber structural members must be inspected every year but are prohibited entirely after 1939, and every crane after being erected on a building or site is to have its anchorage tested with a load 25 per cent above its maximum working load. A comment upon this action in *The Engineer*, London, contains a remark which may be taken as a warning over here: "There are numerous other detailed regulations with which manufacturers and users of cranes will have to make themselves acquainted."

Timber Falsework Used to Erect Suspension Bridge Towers

THE STEEL towers for the St. Johns suspension bridge over the Willamette River at Portland, Ore., have been erected by the use of derricks resting on tall timber falsework. This is a novel if not unprecedented method for modern suspension-bridge construction, and this article, based upon information supplied by R. Boblow, resident engineer for Robinson & Steinman, engineers on the bridge, describes the falsework and the method of erecting the towers. An article describing the bridge, which is unique in that it uses rope-strand cables, was published in *Engineering News-Record*, Feb. 13, 1930, p. 272.

The timber falsework extends to El. +300, referred to the zero datum of mean low water. Each falsework tower rests on 56 piles approximately 100 ft. long and contains 252,000 ft. b.m. of Douglas fir timber, exclusive of piling. The main posts are 12x14-in., the girts 8x10-in. and the diagonal braces 4x12-in. timbers. Connections are bolted and spiked, and steel straps are used for splicing the vertical posts. The falsework is 100x98 ft. in plan at the base and 40x49 ft. at the top.

The falsework was erected by means of a guy derrick acting in the form of a creeper traveler inside the frame. The wood bents were assembled on the ground in 40-ft. sections and lifted into position by the guy derrick.

Field erection has been carried on by means of a stiff-leg derrick on top of the falsework. The boom of this derrick is unusual, being a 28-in. diameter stick of fir 80 ft. long. The mast is directly supported on the double bent which bears on the shelf of the main pier at El. 30. The upward kick of the back legs of the derrick is taken by two sand boxes, each weighing 36 tons and hung from 2½-in. diameter rods.

The bottom section of each of the tower legs was placed upon 28 steel wedges, which in turn rested upon steel plates embedded in the concrete. Final plumbing of the tower was not done until the steel had been erected up to the peak of the first arch, at approximately El. 150. Steel erection for the east tower was begun on May 23 and completed on June 18. Riveting was begun on June 9 and completed Aug. 8. There are approximately 40,000 field rivets in each tower. The heaviest lifting piece is the bottom section, which weighs 34 tons. The greatest amount of steel erected in one day was 131 tons for the west tower. For this tower, steel erection was begun on June 20 and completed on July 8. The erection crews worked two shifts totaling fifteen hours, five days per week. It is stated that the erection, with the use of the timber falsework towers, was particularly easy and free because of the great amount of drift available at practically all elevations. The timber falsework was erected by J. H. Pomeroy & Co., of Portland, subcontractors for erection of all main-span steelwork.

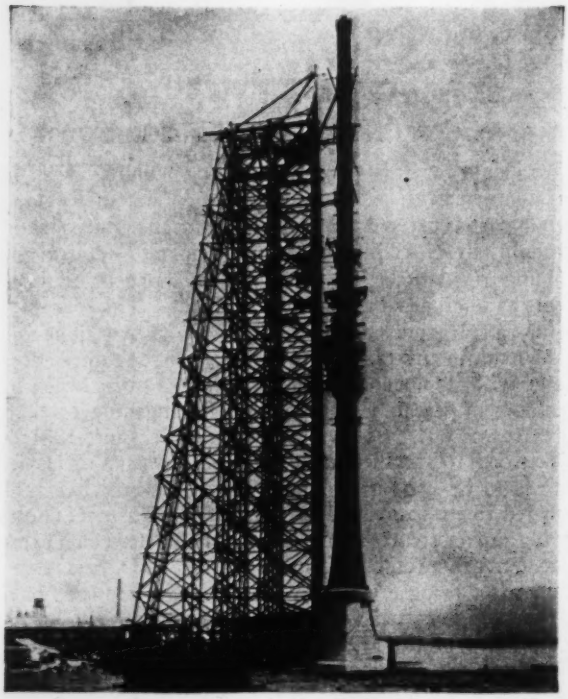


FIG. 1—TIMBER FALSEWORK USED TO ERECT STEEL TOWERS OF ST. JOHNS SUSPENSION BRIDGE

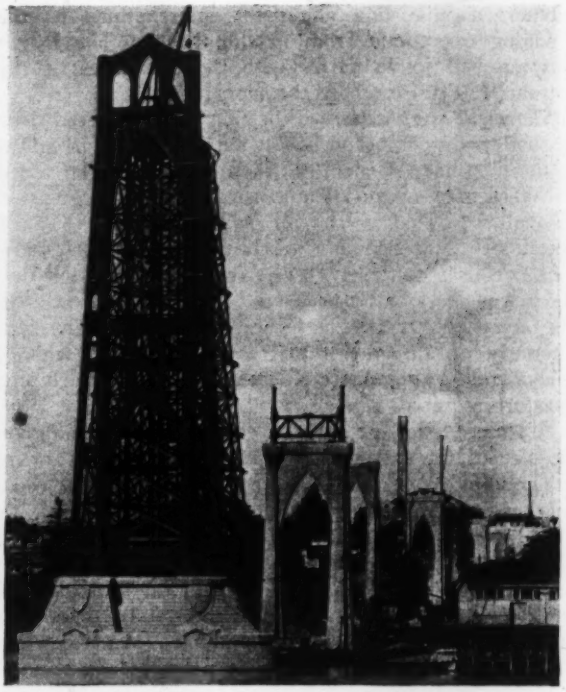


FIG. 2—COMPLETED EAST TOWER WITH CABLE BENT AND APPROACH PIERS IN BACKGROUND

Use of Steel Railway Ties in Argentina

Although there are some steel crossties used by a few of the railway systems in Argentina, the large majority of ties are of wood. Wooden ties are required by law to be made from native woods, and they are usually cut from red quebracho, white quebracho or alagarrobo. Several railway lines, both state and private, have used steel crossties, but as these become too old for further use they are replaced by wooden ties. Until recently about 5 per cent of the trackage of the Central Argentine Ry. was supported on Livesey iron pot crossties, but these have now been practically all replaced. Some steel trough ties are still in use on the Entre Rios, Argentine North Eastern, Central Northern Argentine and the Central del Chubut railways, but the tendency seems to be to replace such ties by wooden ones whenever the opportunity presents itself.

Novel Shield and Hexagonal Concrete Liner Blocks Features of Tunnel Job

Four-Ft. Conduit Tube With Only 5 Ft. of Cover Driven Under Main Line Railroad Tracks—Two-Plunger Jacks Hold Lining Segments in Place During Ring Erection

AN ELECTRICAL conduit tunnel, 4 ft. in diameter and 100 ft. long, involving the use of a new design of interlocking hexagonal precast-concrete lining blocks and a shield having several innovations, has just been driven for the Philadelphia Electric Co. under the busy four-track main line of the Pennsylvania Railroad in North Philadelphia. Although the bore had but 5 ft. of cover, rail traffic overhead was not disturbed or slowed down during construction operations. The tunneling methods and equipment were developed by the contractor, the Tunnel Building Co. The tunnel is located under the main line of the Pennsylvania, just off Pennypack St., near the city's Torresdale water-filtration plant. A progress of 20 ft. per day (10-hour shift) was made through a hard, sandy clay material containing a considerable number of small boulders.

The tunnel has an inside diameter of 4 ft. and a block-lining thickness of 5 in. One complete ring of lining contains eighteen blocks, but because of their hexagonal shape nine alternate segments are always half a block width ahead of the other nine. This feature was an essential part of the shield operation. Half of the eighteen shield jacks were bearing against blocks in place, while the alternate nine, retracted, were extended one at a time under low pressure to hold blocks of the next half ring in place as they were set, eliminating the use of crown bars to hold the top blocks in place during erection. All of the segments are uniform, no key blocks being required. The tunnel presents a neat and smooth appearance inside and shows a remarkable adherence to line and grade.

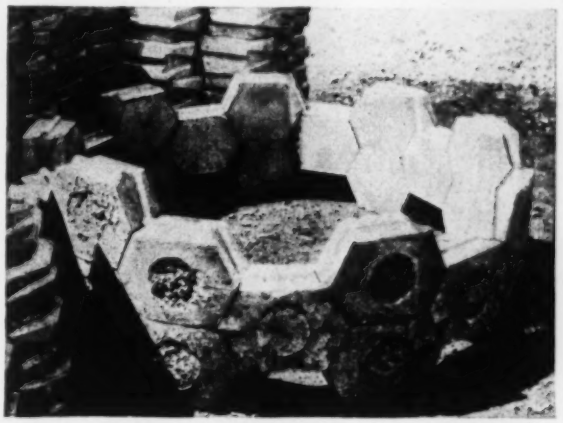


FIG. 1—INTERLOCKING HEXAGONAL CONCRETE BLOCK USED IN LINING PHILADELPHIA TUNNEL
Blocks laid up in rings showing relative position in tunnel. Segments are partially dipped in asphalt before placing.

Shield Design and Operation—There are several interesting features in the shield design (Fig. 2). It is 4 ft. 10 in. outside diameter and has an extreme length of 10 ft. 5½ in. The skin is cast-steel, ¾ in. thick, except for the tail, 14 in. long, which is only ⅛ in. thick. Immediately in front of the jacks the shell is articulated, diaphragm frames of the front and rear parts of the shield being joined by four directional control bolts. The purpose of the articulated shell is that steering of the shield can be controlled by adjusting the control bolts. The extension of the shield hood is adjustable

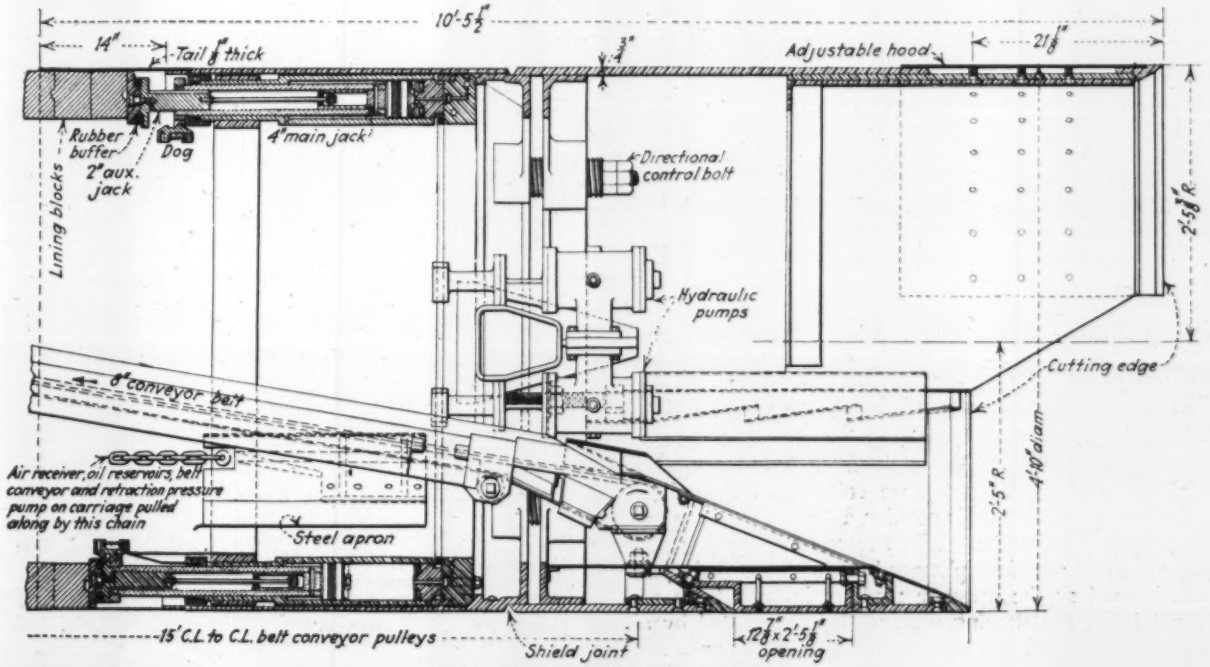


FIG. 2—DETAILS OF 4-FT. SHIELD

FIG. 3—REAR VIEW OF SHIELD IN OPEN

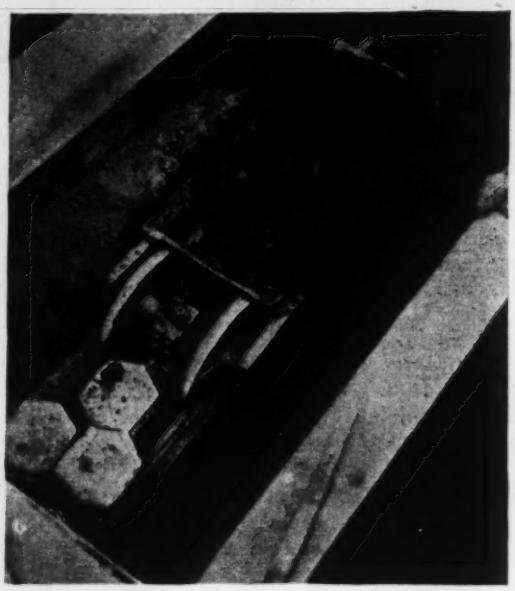


FIG. 4—MUCK CAR AND PART OF BLOCK CAR AT PORTAL

from a position flush with the lower cutting edge to an overhang of 21 in. In the invert at the front end of the shield is a removable section, 12⅞ in. by 2 ft. 5½ in., to provide means for digging out beneath the shell if required.

The eighteen hydraulic shield jacks are arranged to operate in two banks of nine each, alternate jacks making up one bank. Each jack, 4 in. in diameter, is equipped with a 2-in. auxiliary plunger which carries the jack shoe. The jack shoes have a partial ball-and-socket connection with the plunger, giving the shoe an even bearing on the block. When the main jack is extending it bears against the jack shoe collar of the auxiliary plunger, and when in this position a dog on the main jack engages the jack shoe. When retracting, the dog pulls the shoe and auxiliary plunger back with the main jack. Oil is used as the pressure medium in both large and small jacks, the shoving pressure being actuated by air supplied by a portable compressor outside the tunnel. A reducing valve and two three-way valves supply high- and low-pressure oil to the larger jacks. Though the equipment is designed for jacking pressures of 4,000 lb., the maximum required on this job was 1,200 lb., with 240 lb. used as low pressure. The retraction oil pressure is supplied by an air pump floating on the air line, this pressure acting continuously.

The jack-operating cycle is as follows: Consider the shield moving ahead, one bank of nine jacks bearing against alternate blocks during the shoving. When the shove is completed, the high pressure is turned off and low-pressure oil is turned into these nine jacks, just enough to overcome the retraction pressure and hold a slight pressure against the blocks to keep the shield from floating. The alternate bank of jacks is fully retracted, the auxiliary plungers being held back by the dogs. The small jacks are operated by the retraction oil pressure, so are constantly pulling against the dogs. The next ring of blocks is then placed. As one is put in position the dog is released on the auxiliary plunger and the retraction oil pressure forces the small jack and shoe out against the block, holding it firmly in place. When all of the blocks in this ring have been set, the high-pressure oil is turned into the main jacks of the bank, the jacks bearing against the shoe collars and shoving the shield ahead as the first bank of jacks is being retracted.

Muck is excavated at the face by hand and thrown onto an 8-in. conveyor belt 15 ft. long extending back from the front end of the shield, the belt being operated by an air motor. The conveyor, oil reservoir and part

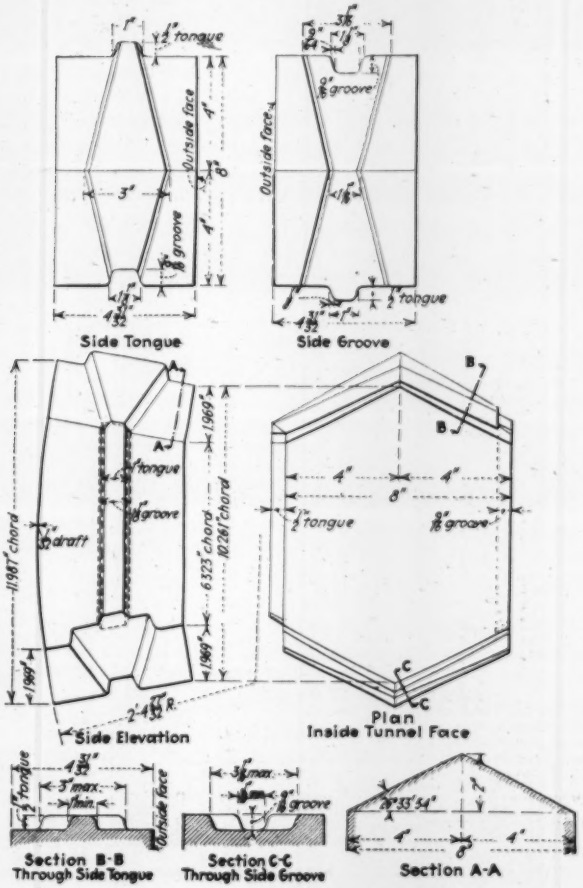


FIG. 5—DETAILS OF LINING BLOCKS

of the jack-control mechanism is mounted on an independent frame and is dragged along by chains fastened to the shield. A 3½-cu.ft. car, capacity enough for one shield shove, running on a 12-in. gage track catches the muck off the end of the belt conveyor. In front of and connected to the muck car is a small flat car for hauling the lining blocks, the car being low enough to pass under the rear end of the conveyor with a load of segments.

Getting the muck car out of the portal, dumping it and getting it back to the conveyor is the limiting factor in the construction operation, for operating the shield is practically continuous. Except for waiting for the muck car, the only time the shield stops moving is the short time required to throw nine blocks into their place in the lining ring.

As the lining is erected within the tail of the shield, where the skin thickness is but ⅛ in., there is negligible loss of ground as the shield passes, causing no settlement of ground surface or structures.

At the start of the tunnel driving, the shield was set on a steel cradle resting on a heavy concrete mat, the cradle being very carefully set to line and grade. The first ring of block was cast into a monolithic-concrete portal headwall, as was the final ring.

Although no water was encountered, the bore was driven on a slight upgrade to provide for drainage and to make easier the handling of the loaded muck car. Excepting the block-making crew, the tunnel gang consisted of seven men and a foreman: one mucker, one machine operator, two men handling and placing blocks within the tunnel, one handling the muck car and two outside men dumping the muck car and loading the blocks.

Block Design and Manufacture—The blocks are elongated octahedrons, 5 in. thick (radial to the center line of tunnel), 8 in. wide (longitudinal to center line of tunnel), formed by two hexagonal faces, the outer face curved to form the outer diameter of the tunnel, and the inner face composed of three flat planes. They are fully interlocking, three of the contact faces having grooves $\frac{9}{16}$ in. deep and the other three having tongues ½ in. high. Details of the blocks are shown in Fig. 5. They contain 0.206 cu.ft. of concrete and weigh about 32 lb. each.

A dry mix, 5 gal. of water per sack of cement, is used in making the blocks, which are unreinforced. Made up of three aggregates, sand, ¼-in. and ¾-in. gravel, the mix was designed for a concrete strength of 5,000 lb. in 28 days. The blocks are formed in a five-piece cast-iron mold, entirely inclosed except for a 5-in. filling hole in the top side. The form sections are held together by outside bolts. During the filling operations and for three minutes afterward, the molds, ten at a time, are vibrated on a special vibrating table. This procedure permits the use of a dry mix and fills the corners of the forms. Concrete is admitted through a short collar above the filling holes of the molds. The excess concrete held in this collar assures the complete filling of the forms.

Twenty minutes after the molds leave the vibrating table they are stripped, except for the bottom panel, which is removed after three hours. The blocks cure for two to three weeks before being used. Excess concrete in the collar is struck off as the forms are stripped. Before being placed in the tunnel, the blocks are dipped in asphalt to within a short distance of the inside face. The asphalt on the contact faces, when squeezed by the pressure of the jack, forms a waterproof filling in the joint.

FIG. 6—APPEARANCE OF COMPLETED TUNNEL

FIG. 7—CAST-IRON MOLDS FOR LINING SEGMENTS
Molds are in five sections, permitting easy stripping. After each use they are carefully cleaned with compressed air and then thoroughly oiled.

In cost, the contractor claims, the method described here compares favorably with open-cut constructions up to 10 ft. in depth. Beyond that depth, he claims, the tunnel method is cheaper.

The present block design does not permit the driving of tunnels on other than a tangent alignment. As the bottom mold sections form the inside tunnel face of the block, vitreous or other special liner plates can be incorporated into the block at time of manufacture, if desired. The contractor is now building a shield and set of block forms for a 6-ft. inside diameter tunnel. The blocks for this size bore will be larger and thicker than those used on the 4-ft. tunnel.

Personnel—The contractor, the Tunnel Building Co., is a subsidiary of the Tunnel Mine & Machinery Co., of Philadelphia, which holds patents on the design and method of manufacturing the blocks and on the design of the shield. A. S. Craven, chief engineer of the company, was in direct charge of the construction operations. S. P. Curtis is president of the company and Horace Campion vice-president.

Portable Belt Conveyors Place Concrete for 150x1,800-Ft. Foundation Slab

Crew of 30 Men and Movable Units Distribute 900 Cu.Yd. Daily Over Wide Area for New Steel Mill—Two 1-Yd. Central Mixing Plants Run on Rails

By J. B. Bray
Vice-President, Fairfield Engineering Co., Marion, Ohio

A MODERN well-planned labor-saving concrete plant and distribution system was developed by the Illinois Slag & Ballast Co. to meet a six-month construction schedule requiring the placing of 90,000 cu.yd. of concrete over a wide area for the foundation of a new open-hearth mill for a steel company in the Chicago district. Made up of two 1-yd. central mixing plants mounted on rails and thirteen portable belt conveyors of varying length, this flexible concrete plant, operated by a crew of 30 men, maintained an average of 600 cu.yd. per day and frequently poured as high as 900 cu.yd. in a ten-hour shift. The contract included the placing of the main foundation, a concrete slab 1,800 ft. long, 150 ft. wide and 4 ft. thick; the construction of two long retaining walls and a number of piers to carry an elevated railroad track; and the building of many piers approximately 20 ft. square at the base and 11½ ft. high located on the main slab. The Fairfield Engineering Co. designed and built the conveying equipment.

Because of the speed required by the contract and the wide area over which work was spread, the contractor necessarily had to plan a rigid construction schedule eliminating hand labor wherever possible. Every operation from the receiving of the aggregate to the actual placing of the concrete, had to be planned and timed well in advance so as to maintain an even flow of concrete throughout the entire working day and throughout the entire life of the contract.

Central Plants—Two complete central mixing plants, including aggregate-storage bins, batchers, mixers and cement-storage bins, were mounted on rail trucks operating on a double set of rails running along one side of and at the same elevation as the main foundation slab. The plant layout is shown in Fig. 1. Cars of slag and sand were brought in on a supply track located on the top of a bank about 25 ft. above the foundation base. Cement cars were brought in on the lower level in front of the mixing plants, and the cement, in bags, was handled through a storage house in the central plant. Aggregates were dumped from the supply cars into 12x12-ft. timber hoppers beneath the unloading track and chuted to bucket elevators alongside the central plants, which discharged the material into storage hoppers at the top of the plant. Less than 30 minutes was required for unloading a car of slag, and cars of sand were unloaded in approximately 45 minutes. A car mover was used to facilitate the movement of supply cars to and from the track hoppers. Each mixing plant was equipped with a 1-yd. mixer operating continuously. The mixers were charged by volume batchers, the cement being handled from the stor-

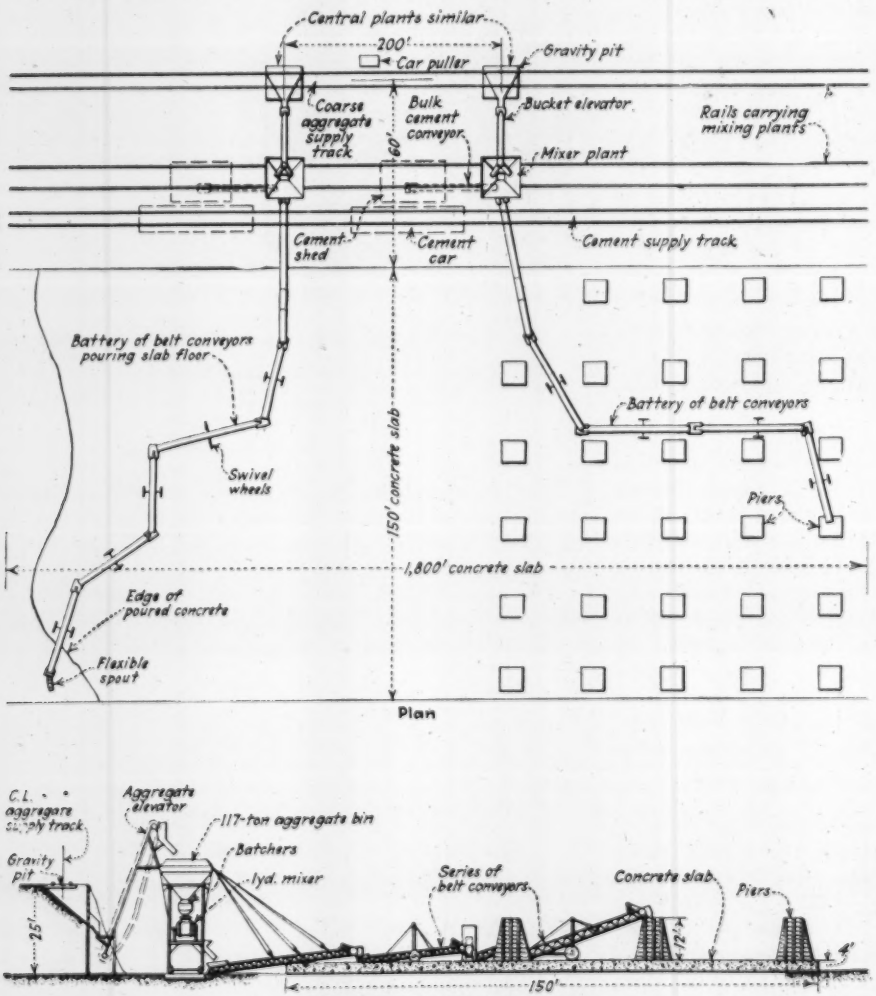


FIG. 1—LAYOUT OF CONCRETE PLANTS

FIG. 2—SERIES OF PORTABLE BELT CONVEYORS DISTRIBUTING CONCRETE FOR STEEL MILL FOUNDATION SLAB

FIG. 3—BELT CONVEYORS IN OPERATION

age bin directly to the mixers by means of inclined and covered belt conveyors. The mixing plants were kept about 200 ft. apart for simplifying movement of supply cars and for the changing of distributing conveyors from one plant to the other with a minimum loss of time.

Distribution System—The concrete-distribution system consisted of two stationary belt conveyors, one attached to each central plant, and thirteen portable belt conveyors of varying lengths. The following portable conveyor units were used: two 25 ft. long; four 30 ft. long; five 40 ft. long and two 50 ft. long. All conveyors were equipped with 24-in. rubber belts operating over carrying idlers of the troughing type mounted on self-cleaning angle bases. The distribution conveyors were all equipped with swiveling-type carriage wheels to facilitate moving and to increase their radius of operation. Each conveyor unit was equipped with an individual electric motor. Figs. 2 and 3 show the conveyors in operation.

At each mixing plant a 50-ft. conveyor received the concrete from the mixer and carried it to a battery of portable conveyors. Used in series, the portable conveyors provided a flexible distribution system that allowed the placing of concrete at various points on the job, with a minimum loss of time required to shift from one point to another.

Concrete was dumped from the mixers directly into the hoppers at the rate of one batch every 70 seconds. The specified mixing time of one minute was cut down to 50 seconds because of the additional mixing that occurred in the gathering hoppers at each end of the belt conveyor.

A maximum crew was used in placing concrete at a distance of 250 ft. from the central plant. Sixteen men were required for this operation, including three men unloading slag and stone, three men unloading cement, the mixer operator and his helper, and a mechanic to maintain the conveyors. About 30 carpenters were kept busy building the forms for the piers and retaining walls.

A 1:3:5 mix concrete was used with the piers and a 1:3:6 mix was used for the main slabs. Slag was used throughout as coarse aggregate.

Jim Parsons, general superintendent for the Illinois Slag & Ballast Co., was in active charge of the entire job for the contractor.

Reorganization of National Railways of Mexico

The Montes de Oca-Lamont agreement regarding the Mexican foreign debt, signed in New York City on July 25, 1930, provides for the organization of a new company to take over the properties and assets of the National Railways of Mexico. This agreement must first be ratified by the Mexican congress before steps are taken to put it into effect. The president of the National Railways has announced that under the new company the Mexican government will control 65 per cent of the capital stock, instead of 50.02 per cent as heretofore, and that during the period from 1931 to 1936 interest payments on the bonded indebtedness of the railways will be scaled down. He also indicated that as soon as the system is on a sound financial basis certain new construction will be undertaken. The proposed new construction includes a line from Santa Lucrecia to Compeche, in southeastern Mexico, and another line from Aristeo to the port of Zihuatanejo, State of Michoacan. The so-called short line from Mexico City to Tampico and the difficult route over the Sierra Madre from Durango to Mazatlan are also possibilities.

Special Taxes and Fees on Billboards

State Legislation and Its Administrative Control, Including Specific Grants of Power to Cities

By James W. Martin
Director, Bureau of Business Research, University of Kentucky, Lexington, Ky.

APPARENTLY only fifteen states levy special excise taxes or fees on billboards, while seven others specifically authorize municipalities to impose them. The fifteen states are Alabama, Connecticut, Florida, Georgia, Kentucky, Massachusetts, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Tennessee and Vermont, and the seven others are California, Illinois, Iowa, Kansas, Pennsylvania (second-class cities levy for general revenue), Texas (only cities of 5,000 population or larger) and Wisconsin. In a considerable percentage of these cases the tax or fee is charged without any purpose of exacting a payment for the use of the public highway; it is levied for regulation or general revenue purposes on the business of outdoor advertising. But a number—Connecticut and Massachusetts, for example — levy the charge definitely as a highway privilege tax. It will be interesting to analyze the systems of taxation in these several states.

Taxes Fixed by Highway Body

The best classification of such taxes, or fees, is that with respect to the basis on which they are imposed. First, there is a group of four states which charges responsibility for prescribing the rates and levying the fees to some administrative body. Massachusetts and Missouri permit the state highway departments to prescribe such fees as they may deem proper, the former indicating definitely that they are to be as nearly as practicable in proportion to the cost of regulating the use of signs along the highways. In practice, according to information supplied by J. E. Dwyer, inspector of outdoor advertising, each advertiser pays in Massachusetts an annual tax of $50, plus examination and inspection fees aggregating $4 a year for each sign maintained. There are special provisions for temporary signs. Massachusetts also authorizes municipal highway authorities to impose license fees for permits to erect highway signs, but such officials may not make the charge more than $1 for each permit. The state highway department of Missouri has never exercised its authority, so that the law is ineffective. The Missouri law relates only to boards of certain types on the highway right-of-way. Alabama and Nebraska lay down more specific statutory direction. The Alabama state tax commission is directed to make such arrangement as it may deem wise, provided the payment may not in any case be less than 20 per cent of the gross income received by the advertising agent who uses the right-of-way. The Nebraska department of public works is called on to fix definite rates, with a minimum of 25c. and a maximum of $5 for each individual sign. In practice the Nebraska measure is not effective, because the department of public works has not granted any permits for six years. The department is seeking to discourage establishment of highway signs. Presumably they are erected anyway. Alabama has also, as a further restriction, a statute providing for licensing companies engaged in the billposting business.

Another group of states makes a flat annual charge for the privilege of carrying on the business of outdoor advertising, though in half of them the amount of the tax varies with the size of the community in which the advertising agency is located. In Alabama the statute provides a schedule of state licenses—and one at half the state rate for counties—varying with the population of the city or town. In Connecticut the flat rate on outdoor advertising companies is $100. In Kentucky it is $10 for each person posting bills for hire (except for resident merchants, county fair associations, theaters and candidates for public office). Nevada makes a charge of $5 for each license, but the statute does not make clear whether the charge is a flat one for each advertiser or for each sign. New Jersey, in the 1929 law, imposes a flat $100 tax on each concern engaged in the outdoor advertising business in addition to the permit fees noted below. In Florida such firms or persons pay a tax of $30 if situated in a town of 10,000 population or more, but only $5 if in a smaller community. The counties may levy an additional 50 per cent of this amount. North Carolina provides a long schedule of rates varying from $10 to $100 for dealers in proportion to the size of the city, the lowest rate being prescribed for towns of less than 5,000 population and also for unincorporated places and the highest for cities of more than 35,000 population. The North Carolina statute authorizes cities or towns to levy a billboard tax not in excess of half the state tax. Tennessee also prescribes rates from $5 to $75 graduated by the sizes of counties, the highest rates applying to those in counties having more than 60,000 population. There is a separate schedule, $10 to $50, for those engaged in advertising by means of electric signs. There is also a third schedule, $15 to $100, but the distinction between it and that given is not clear. (Public Acts, 1927, Chap. 89.)

Charge on Size of Billboard

Finally, six states make the amount of advertising the basis for the charge. In Connecticut the permit fee for those engaged in the outdoor advertising business is $3 a year for each sign containing 300 sq.ft. or less, $6 for each sign containing more than 300 and not more than 600 sq.ft., and $9 for each sign containing more than 600 and not over 900 sq.ft. These amounts are in addition to the flat rate provided. The Connecticut fee is levied on the basis of advertising space employed, so that double the amount specified would be due if both sides of a board were used. Under an earlier law imposing 3c. per square foot the revenue yield was approximately $27,000 in excess of the $42,000 produced at present. In Georgia the rate is 50c. a location (not over 75 lin.ft.). In Mississippi the rates are 75c. for each board of 10 to 100 sq.ft., $1.50 on each from 100 to 300 sq.ft., and $2.50 on each board of more than 300 sq.ft. New Jersey requires a permit fee of 3c. a square foot in addition to the general license mentioned above. In New Mexico the rate is $5 for each sign. Vermont, after prescribing certain regulations concerning the size of the boards that may be used, imposes a rate of 3c. per square foot for poster advertising other than (*a*) that by towns or cities; (*b*) signs on rolling stock, stations, subways or structures used by common carriers; (*c*) lighthouse signs located with the permission of the state highway board. Comparison of revenue yields in various states makes it clear that only those states which base

the levy on space used secure considerable revenue.

The laws of three states contain statutes with peculiar provisions. In Alabama it is provided that an enterprise, in the event it chooses to do so, may pay a flat state tax of $500 in lieu of the prescribed county and state schedules in each municipality in which it does business. Presumably this is to secure administrative simplicity rather than to provide relief for large concerns; it of course has the effect of doing both. In Kansas there is an interesting provision to the effect that the county commissioners may remove certain objectionable signs and enter the cost on the tax roll of the owner, with a penalty of 10 per cent if he fails to remove them. This clearly is not a privilege tax of the usual type. In New Jersey payment of the license and permit fees is "in lieu of all other taxes, license fees or excises for advertising or carrying on the business of advertising by means of billboards and/or other structures." (Sec. 10.)

Tax Administration Agencies

These laws are administered by widely differing agencies in the various states. Alabama and North Carolina alone require the state tax department to collect the charges. New Jersey charges the motor vehicle commission with the task. Connecticut assigns responsibility for administration to the superintendent of state police; Massachusetts, Missouri, Nebraska and New Mexico to the public roads departments, and Vermont to the secretary of state. Several states administer the tax through county officials: Kentucky and Nevada through the county clerks (supervised in Kentucky by the state auditor), and Florida, Georgia, Mississippi and Tennessee through the county tax collectors. In several of the states named the administrative office collects other licenses. In Connecticut, Massachusetts, Missouri, Nebraska and New Mexico, however, responsibility is in the hands of those who are charged with policing the highways.

Revenues produced in 1928 and 1929 by outdoor advertising taxes and fees, so far as data can be obtained, are shown in the accompanying table. It appears likely that the data for Tennessee and Georgia are incompletely reported, but these statistics are based on official records. The amount collected appears on the whole to be sufficient to pay the expense of regulating billboard advertising, though it is clearly inadequate in certain states. The important effect of such a tax, as shown by letters from the Connecticut commissioner of state police, the Massachusetts inspector of outdoor advertising and the executive secretary of the North Carolina tax commission, is not to produce revenue but to eliminate the poorer class of advertising.

REVENUES FROM BILLBOARD TAXES AND FEES IN CERTAIN STATES, 1928-1929

State	1928	1929
Alabama	$6,349	$6,525
Connecticut	38,000	41,955
Georgia	652	.....
Massachusetts	14,000	17,495
Mississippi	2,729	.....
Missouri	None	
Nebraska	None	
New Mexico	Not effective	50
North Carolina	2,700	6,886
Tennessee	943	1,238

Information as to the disposition of revenues is lacking in certain of the states. In many others moneys collected are turned into the general state or county funds. In Alabama, Massachusetts, Missouri, Nevada and New Mexico, however, the moneys collected are to be spent for highway purposes. In Massachusetts there is no revenue other than that sufficient to pay for supervision of roadside advertising. In New Jersey the revenue is returned to the municipality where collected in so far as it is not required for paying administrative costs.

A large number of states not imposing billboard taxes prohibit signs along the roads under certain circumstances. Others, some of which do impose taxes, as Connecticut and Massachusetts, exempt from restrictions advertising by certain favored classes, such as those owning property abutting the highway on which the article advertised is produced or sold. Of three of the states—California, Illinois and Kansas—which specifically authorize municipalities to levy taxes on city advertising, something should be said. California prescribes that the cities, towns and counties may levy for purposes of regulation only, not for revenue. Illinois gives virtually unlimited authority, while Kansas limits the power to cities of the first class. Certain information concerning the exercise of this authority, available for fifteen Illinois cities, will provide illustrative material. (A. T. McMaster, "Sources of Revenue of Illinois Cities," *Illinois Municipal Review*, July-August, 1926, pp. 276-283.) It appears that billboards and electric signs are dealt with separately in most of these cases. So far as the former are concerned five of the cities impose no license requirements; nine levy at flat rates on each advertiser, ranging from $10 to $500 (median $75); and one levies at from $25 to $100, depending presumably on the size of the city. Eight of the municipalities levy no tax on those advertising by means of electric signs; two impose on advertisers flat rates of $1 and $5 respectively; one requires a flat inspection fee of $5.25; one collects a license fee of $1, plus an inspection fee of 50c.; one levies $1 on each sign; and two graduate the rate in proportion to the number of square feet, one at 25c. and the other 5c., plus a flat fee of $3 in the latter case.

Conclusion

Taxation on billboard advertising is of little consequence from a revenue-producing standpoint. It promises, however, to become of considerable importance in regulating the use of poster advertising on and near the highways. Apparently, if it is to be imposed for revenue production, a tax based on the amount of advertising space used is much the most satisfactory method. Judging from reports of administrative officers and the U. S. Bureau of Public Roads, the same method is also the best yet tried for regulation. If the revenue idea is to remain secondary, as it now generally is, such an act should be administered by the state highway department or other highway policing agency in connection with its supervision of road use; otherwise by the state tax department. The latter policy is recommended by Professor Keister, "Report of the Tax Commission of North Carolina," 1928, Chap. 21. As to the probable future, compare Bureau of Public Roads, "Compilation of Laws of the Several States, in Force Jan. 1, 1928, Dealing With the Regulation of Outdoor Advertising"; Bureau of Public Roads, "Roadside Advertising Regulated in All But Seven States" (mimeographed); Bureau of Public Roads, "Nevada Billboard Laws Seek to Preserve Beauty of Highways" (mimeographed); and, especially, Thomas H. MacDonald, "Report of the Chief of the Bureau of Public Roads," 1928, pp. 10, 11.

Two Heavy Spans Floated Into Place to Complete Hackensack River Bridges

One Highway and Two Railroad Structures in Close Proximity Put Into Service by Well-Timed Schedule Involving Shifting of Navigation Channel and Removal of Three Old Crossings—New Bridges Have Vertical-Lift Spans

DURING a five-day period last week in which the river was closed to navigation, three new adjacent bridges, one highway and two railroad, were put into service across the Hackensack River near Jersey City, N. J., by floating two heavy spans into place across the old navigation channel, erecting a third span with a derrick boat and tearing out portions of three old bridges to open a new ship channel. The two railroad bridges were built by the Pennsylvania Railroad, one to carry a double-track passenger line and Hudson & Manhattan tube lines, and the other for a two-track freight line, both replacing old pile-trestle structures. The highway crossing, built by the New Jersey state highway department, replaces an old through-truss structure that had long been a source of traffic congestion, due to poor alignment and a narrow roadway. All of the new bridges have vertical-lift spans.

To provide a straighter channel for navigation, advantage was taken of the new location of bridges to shift the ship channel from the west to the east side of the river. All of the lift spans were built in place over the new channel, while fixed spans over the old channel were left out of each bridge during construction operations to keep the river open to navigation.

Design of New Bridges

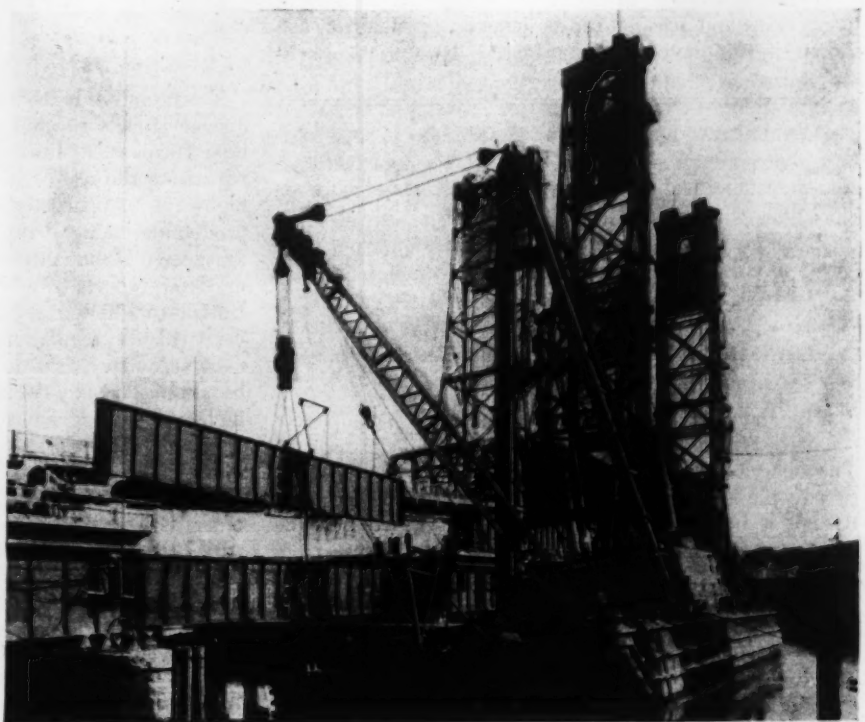
Highway—The highway bridge is a link in state route No. 10 between Jersey City and Newark and Belleville. It is 3,600 ft. long, including approaches, and carries a 40-ft. roadway and two 8-ft. sidewalks. The vertical-lift span, 206 ft. long, has a high-water clearance of 35 ft. when closed and 135 ft. when open. Deck-plate girder and through-truss spans make up the approaches. All steel below the concrete roadway slab on all spans except the lift is incased in gunite.

Freight Line Railroad—At the river the freight line and highway bridges are immediately adjacent and are on common river piers, though the superstructures are separate. The river spans of both bridges, including the lifts, are skewed 39 deg. Because of a freight yard close to the west end of the structure, the freight line bridge was necessarily kept at a low level with less than 13 ft. of clearance over high water for the lift span when closed. The lift, 206 ft. long, has an open clearance of 135 ft. The total length of 1,188 ft. and all spans except the lift are made up of four deck-plate girders carrying concrete track slabs.

Passenger Line—The double-track passenger bridge is 2,950 ft. from end to end of approaches. Except for two truss spans over local roads, the approaches are deck-girder spans carrying track slabs. The river crossing consists of a vertical-lift span of the record length of 331½ ft., two short truss spans carrying the backlegs of the lift towers and one 245-ft. through-truss span over the old navigation channel, all at 40-ft. clearance over high water. Similar to the other two, the lift span clears 135 ft. when open.

Unusually deep river piers were required by all bridges. Pneumatic caissons for the passenger bridge were sunk 122 ft. below high water through 60 ft. of soft muck to rock. Corresponding piers of the other bridges went 110 ft. below high water. A novel method of sinking shafts for the piers of the west approach to the passenger line bridge was described in *Engineering News-Record*, Sept. 4, 1930, p. 366.

A carefully planned schedule of operations that was carried out without a hitch put the new structures into service. The river was closed to navigation from 3:30 a.m. on Nov. 2 to 11 p.m. on Nov. 6. During this



Eric J. Baker Photo

FIG. 1—CLOSING LAST GAP IN HACKENSACK RIVER BRIDGES

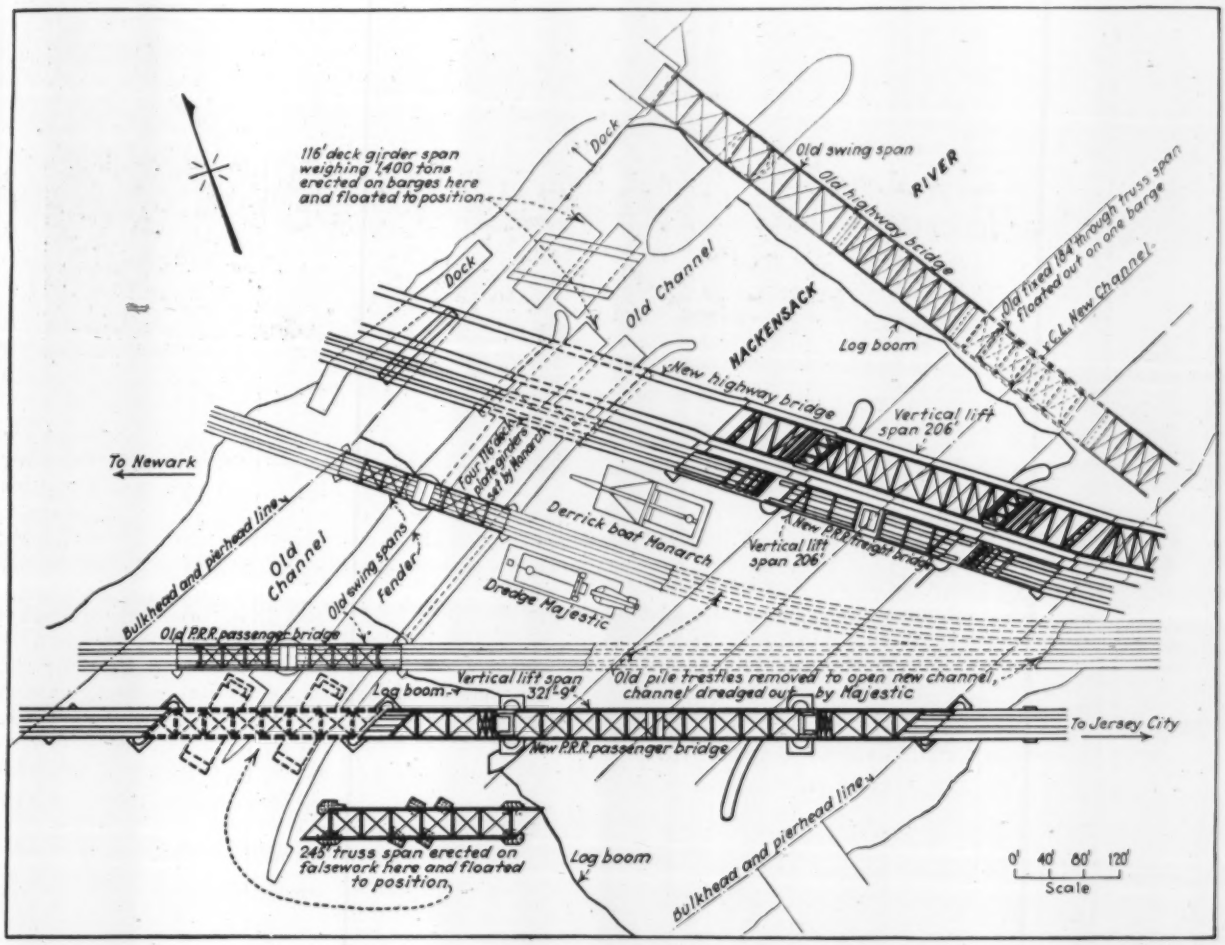

116' deck girder span weighing 1,400 tons erected on barges here and floated to position
Dock
Old swing span
Old highway bridge
RIVER
Old fixed 184' through truss span floated out on one barge
C.L. New Channel
Dock
Old Channel
HACKENSACK
Log boom
New highway bridge
Vertical lift span 206'
To Newark
Four 116' deck plate girders set by floating derrick
Derrick boat Monarch
New P.R.R. freight bridge
Vertical lift span 206'
Old Channel
Old swing span fender
Dredge Majestic
Bulkhead and pierhead line
Old P.R.R. passenger bridge
Log boom
Vertical lift span 321' 9"
Old pile trestles removed to open new channel, channel dredged out by Majestic
To Jersey City
New P.R.R. passenger bridge
245' truss span erected on falsework here and floated to position
Log boom
Bulkhead and pierhead line
0' 40' 80' 120'
Scale

FIG. 2—LAYOUT OF HACKENSACK RIVER BRIDGES

period the spans over the old navigation channel were closed in, the two old pile-trestle railroad bridges and one old highway truss span were removed from the new channel and the channel dredged to navigable depth.

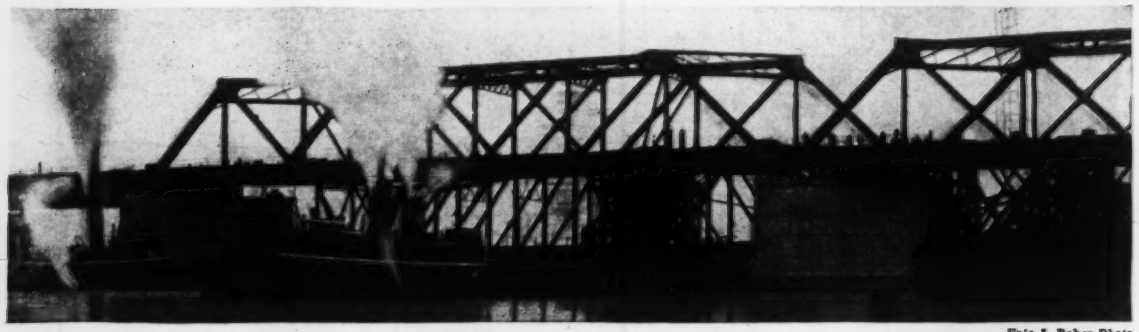
Placing 245-Ft. Truss Span—A through-truss span 245 ft. long and on a 43-deg. skew to close the gap in the passenger line bridge was erected on pile falsework 40 ft. above high water. On the afternoon of Nov. 1 the span, weighing 813 tons, was lifted off the falsework by two barges, each carrying a four-post steel tower. The towers were adjustable in height by a jack and pin arrangement. At high tide, 5:30 on the morning of Nov. 2, the two barges, maneuvered by four tugs, floated the long skewed span into its final position in the bridge (Fig. 3). The first east-bound train passed over the new bridge at 11:30 the same morning, and a few minutes later regular train service was established.

Floating the Highway Span—The gap in the highway bridge was closed by a deck-plate girder span 116 ft. long with a 30-deg. skew. Carrying a heavy concrete roadway slab and with all steel completely incased in gunite, the span weighed 1,400 tons. It was erected and incased on two barges anchored alongside the bridge. Timber cribbing carried the span on the barges, and erection and placing was complicated by the roadway being on a 3½ per cent grade. The span was floated into its final position simultaneously with the placing of the passenger line span. Two tugs stood by, but the maneuvering of the barges was done by a double-drum steam hoist set on an adjacent span of the highway bridge (Fig. 4). Two lines from the hoist handled the barges without trouble. Granite-block paving on this span was completed after the span had been placed. The highway bridge went into service early on Nov. 5.

Freight Line Bridge—The final gap to be closed in the three new bridges was in the freight line bridge. About noon, Nov. 2, after the highway bridge span had been landed and the barges removed, this gap was closed by four deck-plate girders 116 ft. long, weighing 62 tons each, set by a floating derrick. They were brought out on an adjoining span on flat cars and unloaded by the derrick the previous afternoon. Track slabs had been cast in place on the rest of the deck-girder spans of this bridge, but precast slabs were used for completing the final span. These were also set by the derrick. The bridge went into service Nov. 4.

Opening New Channel—As soon as each railroad bridge went into service the corresponding old pile trestle over the new navigation channel was wrecked. A locomotive crane, working from the shore end, and a dipper dredge, working in the river, made short work of tearing out the old structures. Log booms made up of four 10x16-in. stringers tied with cables were stretched across the river above and below the site to collect piles and timber debris torn loose in the wrecking operations. The dredge cleared out the new channel to navigable depth.

The last obstacle to opening the new channel was



Eric J. Baker Photo

FIG. 3—FLOATING FIXED SPAN INTO PLACE IN PASSENGER LINE BRIDGE
Falsework piling on which span was erected can be seen in the right foreground.

FIG. 4—HIGHWAY SPAN LANDING IN FINAL POSITION

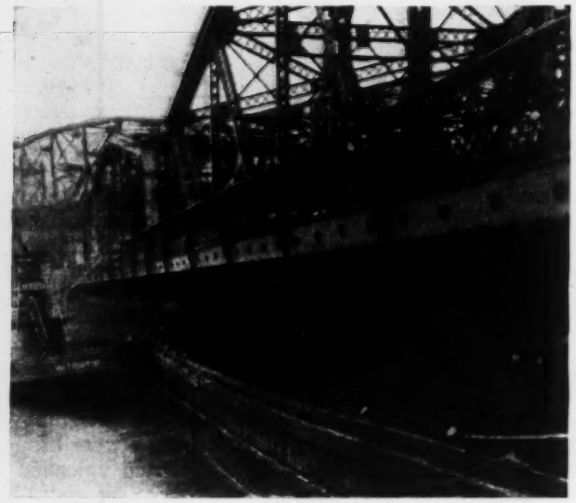


FIG. 5—OLD HIGHWAY SPAN 184 FT. LONG BEING RAISED BY SINGLE BARGE

a 184-ft. through-truss span in the old highway bridge. This was removed on Nov. 5 by floating out on a single barge raised by the tide. Fig. 5 shows the span, which weighed 670 tons, being lifted by the barge. Timber cribbing under both trusses at panel points and under the center of each floorbeam was used.

Contractors and Personnel—The railroad bridges were built under the direction of A. C. Watson, chief engineer, T. W. Pinard, engineer of bridges and buildings, New York zone, and J. J. Vail, construction engineer. Waddell & Hardesty were consulting engineers on the lift spans. On the passenger line bridge Arthur McMullen Co., J. Rich Steers, Inc., and Senior and Palmer, Inc., had contracts for the foundations. Bethlehem Steel Co. built the superstructure and floated the fixed span into place. J. Rich Steers did the grading and trackwork on both railroad bridges, and Frederick Snare Corp. built the track slabs. Allen Spooner & Sons removed the old railroad trestles. The Phoenix Bridge Co. built the superstructure for the freight line bridge.

The highway bridge was built under the direction of H. W. Hudson, assistant construction engineer, S. Johannesson, engineer of design, and O. C. Whitman, resident engineer, New Jersey state highway department. The Foundation Co. and Chas. Kavanaugh held contracts for the foundations. Stroebel Steel Construction Co., Chicago, built all the superstructure. Merritt-Chapman & Scott Corp., removed the span over the new channel in the old bridge. Harrington, Howard & Ash were consulting engineers on the lift span.

Letters to the Editor

Higher Bars for Engineers

Sir—I want to say a few words in regard to higher bars for engineers. In your editorial on this subject you make a comparison between engineering and the legal and medical professions. It seems to me that I learned in school many years ago that only things that are similar can be compared. Engineering is not similar to either law or medicine.

I had a small part in the framing and passing of some of the first license laws, and it is not so simple a proposition as you are trying to make it. To say that a man must be a college graduate to become a licensed engineer, I believe, is going too far. There are many men who have worked their way up in engineering by home study, night courses, etc., who are very competent and deserve a lot of credit for their initiative. To debar such men would, in my opinion, be eminently unfair. There should be a high standard for licensing but it should be fair enough to give such men a chance to meet that standard.

As you are well aware, there are many branches of engineering, and few men, if any, are qualified to do work in all these branches. It is quite evident that a license law which does not take this into consideration is of very little value. It is quite possible to divide engineering into its main branches and give each engineer a license for whatever branch or branches he can qualify under. Anyway, when you stop to think about it, most kinds of licenses are supposed to be issued for the protection of the public—not to build up any particular profession or class of people.

Florida, N. Y., Oct. 20, 1930. F. R. QUACKENBUSH, Consulting Engineer.

The editorial referred to above did not recommend raising the requirements for a license to practice engineering to those required for graduation from an engineering school. That, in our estimation, would be impracticable. On the other

hand, many state laws and the uniform registration law have no educational requirements, not even a primary or high school education. This we believe to be fundamentally wrong. Adequate requirements lie somewhere between the two extremes. Finding them may be a difficult problem, but that should not be a deterrent. Attempts to convert license laws into class legislation have been strongly condemned in our editorial pages in the past. They were not proposed in the editorial referred to.—EDITOR.

Mechanical Methods of Stress Analysis

Sir—I have read with interest the article by C. B. McCullough on "Derivation of Theories Underlying Mechanical Methods of Stress Analysis" in your issue of Sept. 25, 1930, p. 489. Method of displacement of the stress analysis has wide application in design and construction of the elastic structures; therefore its clear presentation is valuable for the profession.

Neglecting the stresses from variation in temperature, the equation for displacement of the solid member will be

$$\delta_{ab} = \Sigma M_a M_b \frac{ds}{EI} + \Sigma N_a N_b \frac{ds}{EF} + \Sigma S_a S_b \frac{ds}{GF}$$

Wherein Na and Nb = direct stresses in the member from the unit load at points a and b, Sa and Sb = shear stresses from the unit load at points a and b, F = area of cross-section, and G = modulus of elasticity for shear. The other indications are similar to those used by the author.

In the beam with ratio of depth to its length less than one-tenth, the influence of shear stresses on displacement is negligibly small. If the forces applied to a beam are normal to its axis, then displacement of the beam will be due only to bending stresses. If, however, any of the forces be inclined, or if the axial forces be applied at the ends, then in the equation for displacement the direct stresses must be considered.

Referring to the author's illustrative problem, Fig. 2, in the article, in the equation for displacement at point b from the unit load acting along the line ta the influence of the direct stresses should be included.

A. A. EREMIN,
Assistant Design Engineer, Bridge Department,
State Highway Commission.

Sacramento, Calif.,
Oct. 8, 1930.

Records of Stone Setting

Sir—In connection with our contract covering the construction of the Milwaukee County Court House, we have been setting Bedford cut stone for the past 2½ months, and our workmen have turned out records of which we are very proud. On Sept. 25 we set in eight hours' work 8,800 cu.ft. of stone, using ten stone-setting crews. For the week from Sept. 18 to 25, inclusive, our crews set 32,000 cu.ft. of stone. For the month Aug. 26 to Sept. 26, working a five-day week and eight hours per day, they set 103,000 cu.ft. We should be interested to learn whether these records have been exceeded by any construction firm in the United States.

Milwaukee, Wis., S. M. SIESEL Co.,
Oct. 6, 1930. Engineers, Contractors.

Where Engineers Meet With Scientists

Sir—I read with a good deal of interest several editorials that have recently appeared in regard to learning the fundamental facts about hurricanes and earthquakes. I am particularly interested in this because about a year ago I proposed to the American Society of Civil Engineers to give a paper on this very subject, but there was insufficient interest for it to find a place on the program.

This serves to illustrate a point in connection with your editorial, "Is Science Serving Engineering?" of Oct. 2. The section of engineering of the American Association for the Advancement of Science brings together such men as Dr. F. B. Jewett, Bell Telephone Laboratories (present chairman); H. F. Moore, University of Illinois; R. L. Sackett, Pennsylvania State College; A. N. Talbot, University of Illinois; President C. R. Richards, Lehigh University; President W. E. Wickenden, Case School of Applied Science; W. R. Whitney, General Electric Co.; Michael I. Pupin, Columbia University, and many others, who are taking an active interest in the section and are trying to advance the very subject your editorial deals with, though in a slightly broader way—that is, science serving engineering and engineering calling upon science for help in solution of its problems.

The forthcoming meeting at Cleveland deals with recent developments in telephony, the mechanics of the telescope, the problem of sewage treatment and water purification on the Great Lakes, some recent metallurgical developments, a symposium on the education of the engineer both before and after leaving college, and other papers, all treating their subjects in a broader way than is customary before the different engineering societies. I hope that you will be interested in supporting this in the future and I would be glad to send you advance announcements. I personally have taken great interest in your editorials in recent years and feel that you are doing a real service in fearlessly calling attention to certain things which can be corrected which are frequently ignored by others.

N. H. HECK,
Washington, D. C. Secretary, Section M, A.A.A.S.
Oct. 11, 1930.

Engineering Study of Earthquakes

Sir—I have read with interest the editorial in your Oct. 2 number, "Is Science Serving Engineering?" I am glad that you have called attention to this subject, though it is necessary to take exception to some of the statements.

I believe that in preparing the editorial, in so far as it relates to earthquakes, the significance of the item on p. 543 in regard to the American Society of Civil Engineers was overlooked. You will note that the board of direction of that society made an urgent plea that the government provide funds for increase of seismographic work by the Coast and Geodetic Survey, and on p. 544 it is stated, "The appeal for a seismographic appropriation carries out recommendations looking toward collection of earthquake data on periods, amplitude and acceleration in order that engineers may design and build better earthquake-resistant structures."

In the very meeting of the Eastern section of the Seismological Society of America at which Mr. Freeman made the statement to which you referred, papers were given on the design of an instrument to accomplish the very thing which Mr. Freeman had in mind, and one session of the meeting was devoted to this subject. Therefore, to a certain extent Mr. Freeman's statement was taken out of its context. There was abundant evidence at that meeting that the engineering aspects of seismology are receiving serious consideration.

However, what has been done in the past matters less than what is to be done in the future. I am fully in accord with your basic thought that the future progress in the engineering aspects of seismology should be more rapid than it has been in the past, and I am sure that the seismologists agree to this. However, we must remember that engineering is essentially an art whose successful practice must be a superstructure resting on a solid foundation of predetermined scientific facts and principles. We must not lose sight of the fact that seismology is still relatively in its infancy and that part of this foundation, especially that in which the engineer is most interested, has not yet been laid. However, I am very certain that much of the research in seismology of the past, which at first thought may seem to have no relation to engineering, in fact constitutes a very essential part of the foundation to which I have referred. There are many interrelations and I know of several instances in which engineers and seismologists discussing this very problem have thrown light on each other's special problems.

For five years the Coast and Geodetic Survey has been charged with seismological investigation on behalf of the government. For two years no additional funds were provided for the work, and the Survey was able to carry on only certain routine functions taken over from the Weather Bureau. During the latter part of the five years steady progress has been made both in perfecting its own program and in developing relations with the many activities engaged in the work. The need for making its earthquake studies

meet the needs of the engineer and architect has been emphasized from time to time in publications of the bureau and has been given serious attention. During the past few months it has been possible, through the helpful interest of Mr. Freeman and others, to make considerable progress in working out the details of the project referred to in the resolution of the American Society of Civil Engineers.

Briefly, the essential problem is to install instruments in the central region which will record during the earthquake, survive and give a satisfactory record. Simple devices used in the past have failed because they cannot record the complicated earth movements. Our studies have developed the fact that the instrument must be a modification of existing seismographs in order to meet the special conditions.

Thought is also being given to the problem of interpreting the results. All known evidence of earthquake damage points to great complexity in the motions. It seems logical that the best way to interpret these motions is to work from the region outside toward the center, using all available seismological records and methods in order to make a satisfactory interpretation.

With reference to the last paragraph of your editorial, we all admire the very important results in research obtained by the engineer, but after all he is not in the least separating himself from science and could make no progress at all without making use of the latest developments in all branches. I think that the real progress is going to be made by co-ordinating more and more the activities of science in general with the special problems of the engineer. With such a viewpoint it matters little who does the work.

To indicate the strength of the movement toward solving the earthquake problem: The Massachusetts Institute of Technology is greatly interested, is establishing a seismograph near Machias, Me., to study earthquakes in that region, and is at work on the development of instruments for the recording of near-by earthquakes (in co-operation with the Coast and Geodetic Survey and the Bureau of Standards). St. Louis University is studying earthquakes and earth movements in the Mississippi Valley, information of fundamental importance to the engineer. In California there is a very complete organization, consisting of the principal universities, the Carnegie Institution of Washington, and many others, including the national government, to find out the fundamental facts, and it is hoped that in the near future active work on the program will begin with the installation of suitable instruments in a region which history shows as likely to be subjected to an earthquake of some severity.

From the tone of your editorial I assume that this activity will receive the full support of engineers upon whom we are depending to make use of the results obtained. That this assumption is justified is indicated by the important work which has already been done under Professors Hoover and Jacobson at Stanford University in operating a large shaking platform to test engineering structures.

R. S. Patton,
Director, U. S. Coast and Geodetic Survey.

Washington, D. C.,
Oct. 13, 1930.

Pittsburgh's Building Code

Sir—Replying to your request for further information on the building-code situation in Pittsburgh, as outlined in my letter of Oct. 11 (*Engineering News-Record*, Oct. 23, p. 663):

The interests of public safety are safeguarded by requiring compliance with principles of standard recognized practices such as those of the A.S.T.M. A means is provided for approval of a desired form of construction or design by establishing a test procedure and test methods and requiring that the form of construction or design shall pass one of the appropriate tests. In case the design or form of construction has passed the tests, then the bureau of building inspection is expected to approve it after appropriate specifications have been approved. Thus, it is not necessary to amend the ordinance in order to use a new form of construction or a design. A significant paragraph in the code will serve to illustrate the meaning of the foregoing, as follows:

> The right is hereby extended to the manufacturer, agent or other legal representative of any building material, system, unit or form of construction to test same according to the standard requirements of this ordinance and to prove the suitability thereof for the purpose for which it is intended to be used.

The ordinance then goes on to establish these standards by including the standards in the form in which they are generally recognized by the A.S.T.M. and other similarly recognized societies.

John A. Ferguson,
Consulting Engineer.

Pittsburgh, Pa.,
Oct. 20, 1930.

Road Design for Uniform Speed

Sir—I believe there is a typographical error in the article on road design in *Engineering News-Record*, Oct. 2, 1930, p. 539. The article suggests that the maximum superelevation of pavements on curves be increased to 0.2 in. per foot of width. As the present commonly accepted maximum superelevation is 14 in. per foot of width, I believe the author intended to suggest that it be increased to 0.2 ft. per foot of width.

William E. Barker,
Highways and Municipal Bureau.

Chicago, Ill.,
Oct. 8, 1930.

The 0.2 in. per foot as printed was an error; the statement should have been 0.2 ft. per foot.—Editor.

Special Steel in Bridge Girders

Sir—My principals have called my attention to a statement made in an article in the Aug. 14, 1930, issue of *Engineering News-Record* entitled "Special Steel Reduces Weight of 935-ft. Girder." In the last paragraph of the article (p. 253) it is stated that the steel called St52 was made by Mitteldeutsche Stahlwerke. This is not quite correct. The bridge was designed by the Maschinenfabrik Augsburg-Nürnberg Co. in collaboration with the Mitteldeutsche Stahlwerke. The main girders are made from steel 52 which was furnished mainly by the Gutehoffnungshuette, the Mitteldeutsche Stahlwerke and the Vereinigte Stahlwerke.

This bridge has been so designed that its width of 55.8 ft. can be increased to 82 ft. without stopping the traffic on the present bridge section, as soon as increased traffic makes this necessary. To widen the bridge an additional girder will be placed on either side of the existing bridge, so arranged that it will be possible to locate two express tracks between the outer main girders and below the present roadway.

F. J. Joerger,
Representing the M.A.N. Co.

New York, N. Y.,
Oct. 10, 1930.

Objects to Term "Vehicular" Tunnel

Sir—In this age of crime, the criminal tendency seems to be looking for all the possible outlets and fields for activity.

We have suppressed our indignation with much patience and long suffering since the original introduction of the word "vehicular" tunnel for the Holland tunnel under the Hudson River. It was our hope that this crime against our language would die a natural death with this one application.

The article on p. 509 of your Sept. 25 issue, headed "New York Tunnel Plans," indicates that this most awkward, non-euphoneous, illogical and unnecessary corruption of a word already sufficiently difficult to pronounce, "vehicle," is to be perpetuated because someone started it and no one apparently considers it his business to analyze why.

A vehicle tunnel is no more a vehicular tunnel than is a railroad tunnel a railroadular tunnel; a water tunnel a waterular tunnel; a freight tunnel a freightular tunnel, or a streetcar tunnel a streetcarular tunnel. Let us change them all or none. None of the names given is any more awkward than "vehicular."

L. F. Harza,
President, Harza Engineering Co.

Chicago, Ill.,
Oct. 3, 1930.

News of the Week

Canada to Expend $50,000,000 to Aid Unemployment

The Canadian government has given approval to expenditures of more than $37,000,000 for public works to relieve unemployment. Expenditure of approximately $14,000,000 has been authorized by various provinces and municipalities, and many of these undertakings are already under way. The construction and improvement program for the Canadian National Railways calls for an outlay of $11,139,650 and that of the Canadian Pacific will cost $11,514,000. Relief work in Quebec and Alberta still to be considered will probably bring the total expenditure up to approximately $50,000,000.

Exploration Work to Start on New San Gabriel Dam Site

A contract, at the price of $20,000, has been awarded to Cannon Bros., of Los Angeles, for core drilling one of the three new San Gabriel sites which recently were selected in place of the abandoned Forks site. In addition to this core drilling, tunnels into the canyon walls will be driven by McGuire & Young under a $7,000 contract.

The site to be explored at once is known as dam site 1; it is located 2 miles above the Pine Canyon site of the city of Pasadena, which city has given formal permission for the exploration work.

War Department Approves Bridge Over Hudson at Catskill

The U. S. War Department has approved plans of the State Department of Public Works of New York for a bridge across the Hudson River near Catskill. To meet objections made at a public hearing, plans for the bridge were revised to provide for a cantilever span instead of an arch span and for an increase in vertical clearance for the total distance between piers to 135 ft. at mean high water.

I.C.C. Permits Long Island R.R. to Abandon Whitestone Branch

The Interstate Commerce Commission has affirmed its previous finding that public convenience and necessity permit abandonment by the Long Island Railroad of a portion of its Whitestone branch, but the commission's order indefinitely postponing the effective date of authorization to abandon will be allowed to stand until the road proposes an arrangement for substitute service that meets with the commission's approval. The commission's report states that the road will be expected to submit its proposal in detail within 60 days. Working out this plan, said the commission, may be difficult and will doubtless afford opportunity for controversy as to the reasonable obligation of the company in furnishing service as well as in the rates to be charged. The commission stated that the co-operation and aid of the New York state transit commission and the city of New York will be necessary to solve the questions involved. The commission's report follows reargument of the case on petition of the transit commission. As the line is entirely within the limits of the city of New York, the commission's right to authorize abandonment has been questioned by both state and city authorities.

Many Bond Issues Approved at the Polls

Financial Measures of States and Municipalities Receive General Approval—Questions of Policy Also Acted Upon

ELECTION results from all sections of the United States indicate that the voters, in general, acted favorably upon bond issues submitted for their approval by states, counties and municipalities on Nov. 4. Of the state issues, the outstanding in point of size was that of New Jersey, which has received approval of three separate issues totaling $100,000,000, of which $83,000,000 will be used for highway construction and grade-crossing elimination, $10,000,000 for construction of state institutions, and $7,000,000 for the acquisition of water-supply reserves.

Louisiana approved a series of bond issues totaling more than $85,000,000, of which $75,000,000 will be used for road and bridge construction. This amount includes $7,000,000 set apart for a bridge across the Mississippi River and $8,000,000 for bridges in other sections of the state. Construction of a new state house at Baton Rouge will require $5,000,000. Louisiana voters also approved an issue of $4,500,000 for refinancing in New Orleans and of $1,000,000 for the construction of an airport on Lake Pontchartrain, the latter to be undertaken by the Orleans Levee Board. Other measures acted upon in this state included the addition of 1c. to the gasoline tax and a constitutional amendment allowing municipalities to grant tax exemption to new industries. Of the additional gasoline tax money, 50 per cent will be used for educational purposes and the remainder for port developments at New Orleans and Lake Charles.

Other state bond issues approved, and the purposes for which they are to be used, are as follows: New York, state institutions, $50,000,000; California, veterans' welfare, $20,000,000; Illinois, conservation, $14,000,000; Montana, state institutions, $3,000,000; Wyoming, highways, $2,800,000. A state bond issue of $10,000,000 for highway construction in Arizona failed of passage.

UP IN THE AIR AGAIN!

The above cartoon, published in the San Francisco *Chronicle* the day after election, aptly describes the garbage disposal situation in that city. Having voted for incineration at a previous election, on Nov. 4 the citizens of San Francisco rejected a proposed bond issue for building an incinerator. At present garbage is being put through a Thackeray destructor, now more than 30 years old, overloaded and inefficient. Rejection of the bond issue is taken as a rebuke to the board of supervisors, earned by their policy in handling the whole subject of incineration. The question of whether the needed incinerator can be built and operated under private management is now under consideration.

Local Bond Issues

Of outstanding interest among the minor political divisions was the $35,000,000 bond issue of the Golden Gate Bridge & Highway District, comprising San Francisco and five nearby counties in California. With practically all returns in, the vote on this issue was 137,047 for and 42,493 against, giving well over the required two-thirds majority. This result was forecast by the preliminary figures given last week in

Engineering News-Record, p. 741. The city of San Francisco also approved harbor improvement bonds to the amount of $10,000,000, and $850,000 for the construction of a county jail. Additional issues for the construction of an incinerator and an airport did not receive the required two-thirds vote.

The city of Los Angeles failed to pass two bond issues totaling $19,300,000 for the use of the power and light department and for trunk sewer extensions.

In the Chicago district the voters reversed their usual attitude and approved issues totaling $28,520,000, to be used for the park and playground purposes and for street improvements. Chicago voters also recorded a favorable vote in a referendum proposing filtration of the city's water supply.

Cleveland and Cuyahoga County, Ohio, also acted favorably on bond issues. City bonds approved totaled $31,500,000, to be used for a sewage-disposal plant ($14,000,000), for the construction of sewers ($5,000,000), and for street improvements, river straightening, parks and buildings. The county issues approved provide for a new bridge over the Cuyahoga River, $6,000,000, and for new county buildings, $1,850,000.

In Baltimore, Md., the city received permission to issue bonds for the following purposes: Harbor improvements, $10,000,000; airport construction, $2,500,000; streets, bridges and grade-crossing elimination, $2,000,000; schools, $1,500,000.

In addition to those noted there were a large number of smaller municipal issues approved in various sections of the country. These are listed on p. 64 in the Construction News section. Major issues defeated included bridge bonds for Lorain County, Ohio, $2,000,000, waterfront improvements at Portland, Ore., $1,250,000, and a city-county building at San Diego, Calif., $1,000,000.

Other Measures Acted On

Issues not involving immediate financing were voted upon in several sections of the country. The states of Washington and Oregon voted favorably, in referendum votes, on similar bills to permit the establishment of local public utility districts for the purpose of conserving water and power resources. These districts are given the power to levy taxes to supply public utility services, including water and electricity for all uses. The city of San Francisco defeated a charter amendment which would have created a public utility commission. The proposal to consolidate the city and county of St. Louis, Mo., was defeated, as was a proposal to permit excess condemnation by the city. Detroit, Mich., voted favorably on the proposed elevated motor highway over the tracks of the Grand Trunk Railway between Detroit and Pontiac, but refused to sanction the annexation of 17 square miles of territory, with a population of about 37,000, lying north of the city in Oakland and Macomb counties. The city manager plan of government was adopted by Oakland, Calif.

Elizabeth, N. J., Buys Water-Distributing System

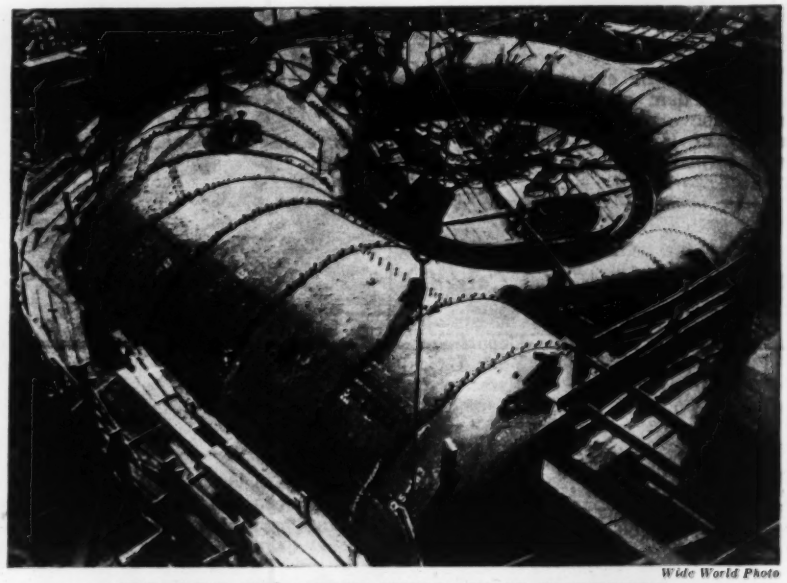
Purchase by the city of Elizabeth, N. J., from the Elizabethtown Water Co., of the company's water-distributing system in Elizabeth at a cost of $3,998,277 is announced. The purchase is effective April 1, 1931. In addition, the city agrees to purchase 2,700,000 gal. of water daily from the company for ten years. The city consumes from 17,000,000 to 19,000,000 gal. of water daily, the remainder of the supply coming from the Wanaque reservoir. The population of Elizabeth in 1920 was 95,783 and in 1930 it was 114,557.

New Setup for Regulation of Canadian Waters

As a consequence of the recent transfer by the Canadian government of the natural resources to the three prairie provinces, the regulation of waters and lakes and streams in those provinces will in future be under the jurisdiction of a new western provinces water board, to consist of four members, one each to be appointed by the governments of Manitoba, Alberta and Saskatchewan and one by the dominion government. The board will see that each of the provinces and territories concerned is assured fair and reasonable disposition of common waters. When it is proposed to build dams or other structures which will affect the natural level or flow of interprovincial waters, the board will investigate and give approval conditional upon proper protection of any interests that may be adversely affected on the other side of the provincial boundary.

New York to Provide School for Building Inspectors

City and village officials in charge of the inspection of buildings, including superintendents of buildings, building inspectors and fire chiefs, will be invited to attend a training school in Syracuse on Dec. 2 and 3 under the direction of the New York State Conference of Mayors, the state department of labor and the state board of housing. This school is a part of the program to provide training facilities in New York State for all groups of municipal officials. There will be five sessions of the school, and the curriculum will include studies of the labor law, model housing code, minimum standards for building codes, administration of building codes, checking structural designs, building construction, elevator installation, hoistway construction and structural weaknesses or defects.



Wide World Photo

WORLD'S GREATEST HYDRAULIC TURBINES FOR RUSSIAN POWER PLANT

Construction of the scroll case for one of the great hydraulic turbines now being installed in a power plant on the Dnieper River in Russia is shown herewith. The present installation will include four turbines of 85,000 hp. each. Ultimately the plant will contain ten such units. Each unit will operate under a head of 117 ft. and will take a flow of 7,500 sec.-ft. The turbine runners were built in this country by the Newport News Shipbuilding Co. In physical dimensions they are similar to the runner built by the same company for an addition to the Spier Falls plant on the Hudson River except that the runner for the latter plant is 8 in. deeper. Its output, due to lesser head flow, is 57,000 hp. Hugh L. Cooper, New York, is consulting engineer.

Bids for Boulder Dam Expected to Be Called For by December First

AS A PART of the program for accelerating construction and providing relief for unemployment, the reclamation service of the department of the interior has speeded up its preparation of plans looking toward the construction of Boulder dam, and announces that the various large contracts in that connection will be let six months ahead of the dates contemplated a few weeks ago. About $3,000,000 worth of contracts will be advertised on Nov. 15, and as soon as bids are in and the contracts awarded 500 men will be put to work.

Track is already being laid for the branch of the Union Pacific Railroad that will run out to the town, which is to be built at the top of the divide looking down upon the dam site. The ground plan of the town is already designed and streets and railway sidings will soon be under construction. About $200,000 will be spent in government-owned buildings in this town. Many other buildings will be constructed to house the workers employed by contractors. Bids for the contract for a water supply will be asked for very soon. Water will be pumped from the river, 2,000 ft. below the town.

Road Work Plans Hastened

Specifications for the construction of a wagon road about 6 miles over very rough terrain are being rushed and it is expected that they will be ready to submit to contractors by Nov. 15. This road will cost about $300,000. Specifications are likewise being hurried forward for the construction by the government of a railroad covering this same mountainous 6 miles to bring freight necessary for construction to the rim of Black Canyon. This road will cost somewhere near $1,000,000. The contract to supply the power necessary in carrying out the construction work at the dam has already been let and calls for the construction of a power line from the Los Angeles area to the dam site. Already this line is being built and will be pushed at top speed that it may also reach the dam site by the time transportation facilities to it are available.

Bids for Dam Dec. 1

The department of the interior announces that it expects the specifications for the Boulder dam to be ready by Dec. 1 and that a call for bids will be issued at that time. The first of the tasks at the dam site will be that of driving four tunnels, each 50 ft. in diameter and about 1 mile long, through the solid volcanic rock cliffs on each side of the canyon. These tunnels alone will cost from $15,000,000 to $20,000,000. When they are completed, a cofferdam 80 ft. high will be constructed some distance above the site of the permanent dam and a similar one below the dam site. Their purpose will be to divert the water, no matter how great the floods, through the four great tunnels during the time of construction.

Ninety days will be given contractors to submit their bids. The contract, therefore, is expected to be let about March 1.

©Underwood & Underwood

L. D. BLAUVELT

Louis David Blauvelt, state highway engineer of Colorado and former chief engineer of the Moffat Tunnel Commission, whose death occurred Oct. 26. An account of Mr. Blauvelt's career appeared in last week's issue, p. 742.

New Type of Cargo Carrier on Great Lakes

A new type of marine equipment was introduced on the Great Lakes on Nov. 10, when the "J. R. Sensibar," the latest vessel of the Construction Materials Corporation's fleet, left Lorain, Ohio, on her maiden voyage. This boat, which represents an investment of $2,000,000, will go into the middle of Lake Michigan, fill itself with sand from the lake bottom at the rate of more than 50 tons a minute until its holds are full, dewater this 10,000-ton cargo if required, and transport it under its own power either to a storage dock to unload it automatically onto a pile of any height up to 80 ft. or to a reclamation site along the lake shore to discharge it hydraulically through pipes at any point within 4 miles of shipside. The entire 10,000-ton cargo can be unloaded in three to five hours, according to its nature. The boat is designed for use not only in transporting sand but for carrying other cargo—coal, gravel, stone, etc.—so that it may be employed for a variety of tasks.

The ship has an over-all length of 556 ft., beam of 56 ft. and speed of 14 miles an hour. Its special equipment includes a drainage system for dewatering an inundated cargo, convertible coal and oil burner, superheaters, soot blowers, induced draft, electric refrigeration, electric hoists, radio and radio compass. Complete control of loading and unloading is maintained from the pilot house.

Report Filed in Suit on Utah River Beds

The report of Charles Warren, special master appointed by the U. S. Supreme Court to make findings of fact and conclusions of law in the dispute between the United States and the State of Utah over the ownership of three river beds in Utah has just been filed with the court. The United States claimed title to the river beds of the Green, Colorado and San Juan rivers within the State of Utah by virtue of the treaty of Guadalupe Hidalgo in 1848. The State of Utah also claimed title.

Mr. Warren reports that the sole issue is whether the rivers in question were navigable within the state on Jan. 4, 1896, when Utah was admitted to the Union as a state. If they were, the river beds belong to the state; if they were not, they belong to the United States.

The special master finds that on the date in question the Grand and Green rivers were navigable and title vests in the State of Utah. The San Juan River and part of the Colorado were not navigable on that date and title vests in the United States. Part of the Colorado, however, Mr. Warren finds, was navigable and belongs under the law to the state.

Montana Power Co. Granted Two Natural Gas Franchises

The application of the Montana Power Co. for franchises to distribute natural gas by pipe lines in Butte and Anaconda, Mont., was granted at recent elections held in the two cities. The Butte election, on Oct. 28, resulted in a majority of nearly seven to one; 2,767 votes were cast for the franchise, and 409 against. The election in Anaconda, Oct. 29, resulted in 876 for the franchise and 177 opposed. Two other elections involving gas pipe line franchises of the same company are set for Nov. 11, at Bozeman, and Nov. 14, at Livingston. These two cities are on the route of the proposed line.

The company plans to construct pipe lines to bring natural gas 250 miles across the mountains from the Montana gas fields to Butte and Anaconda at an expenditure of $12,000,000 to $15,000,000 and to build distribution systems in Butte and Anaconda for about $2,000,000.

Highway Research Board to Discuss Results of Work

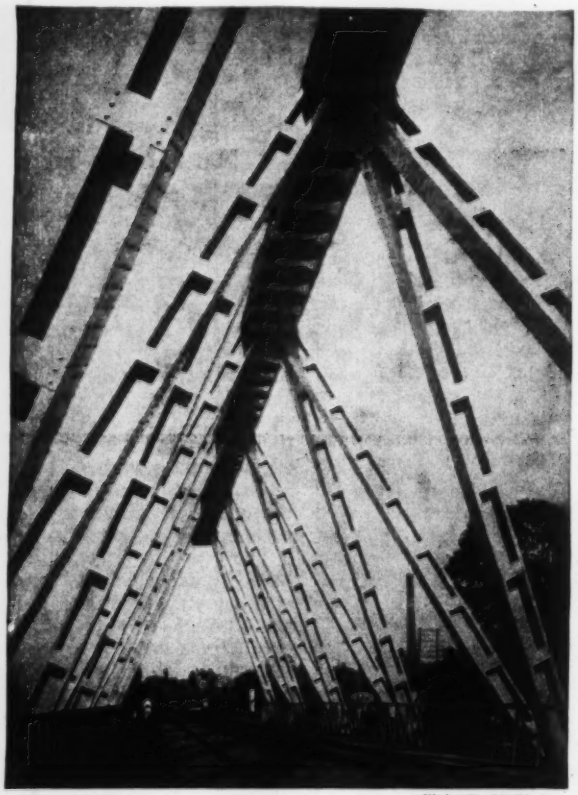
A meeting of the Highway Research Board has been called to be held in Washington Dec. 11 and 12 for the purpose of presentation and discussion of the results of research work in connection with the building and use of highways. All interested persons are invited to attend. At the meeting committee reports will be made and results of special investigations outlined.

Philadelphia Engineers to Discuss City Traffic Problems

"City Traffic Problems and Their Remedies" will be discussed at a joint meeting sponsored by the Engineers Club of Philadelphia and the Philadelphia section of the American Society of Civil Engineers at the Engineers Club in Philadelphia during the afternoon and evening of Nov. 20. Speakers and their subjects are as follows: "Parking and Loading," by a speaker of national prominence; "Bus Traffic Problems," Carl W. Stocks, editor, *Bus Transportation*, New York; "What About the Street Car?" Dean Locke, research engineer, United Electric Railway Co., Baltimore, Md.; "Traffic Signs, Signals and Markings," Ernest P. Goodrich, consulting engineer, New York; "Traffic Accidents," speaker to be announced later. "Uniformity in Traffic Regulations," C. S. Stark, assistant manager, transportation and communication department, Chamber of Commerce of the United States, Washington, D. C.; "Economic Justification of Traffic Improvements," Hawley S. Simpson, research engineer, American Electric Railway Association; "An Outstanding Example of Accident Reduction," Franklin M. Kreml, director, accident prevention bureau, Evanston police department, Evanston, Ill.; "State Control of Traffic," Maxwell Halsey, state traffic engineer, Massachusetts department of public works, Boston, Mass.

Paris Constructing Auto Tunnel

To alleviate the increasingly heavy motor car traffic in one of its most exclusive residential districts, the city of Paris, France, is building a tunnel from near the Porte Dauphine diagonally under the Avenue Foch to be used exclusively by automobiles, according to a report received in the U. S. Department of Commerce. The total length of the tunnel, including the approaches, will be 1,478 ft.; the subterranean section 820 ft. The tunnel will have four lanes of traffic, and will pass from 7,000 to 8,000 cars an hour. An underground tunnel for pedestrians will be included.



Wide World Photo

UNUSUAL BRIDGE COMPLETED IN GERMANY

This unusual railway bridge with a triangular cross-section has recently been opened near Dueren, Germany. It accommodates two lines of railway track and two footwalks. Major dimensions are: span, 256 ft.; width at bottom, 44 ft.; height, 47½ ft. As the illustration shows, the two side trusses incline to connect at a single top chord.

State's Right Upheld to Limit Weight of Vehicles on Roads

The Illinois supreme court, in the case of the People against W. Linde, has ruled that the legislature is within its constitutional rights in limiting the weight of vehicle loads on roads in Illinois. Linde was in the employ of Green, Mullenbruck & Nagel, Inc., a corporation engaged in construction work. When arrested Linde was driving a truck towing a trailer upon one of the improved highways of the state on the way to a job on which the corporation was engaged in building a state road bridge. Upon the trailer was a crane, and the weight on the front axle of the trailer was 28,000 lb. The state law provides that the maximum gross weight to be permitted on the road surface through any axle of any vehicle shall not exceed 16,000 lb. On being convicted and fined in the lower court, Linde appealed.

The evidence at the trial disclosed that the corporation could not be a successful bidder on construction jobs of the type to which the crane was being moved unless such crane could be used; that if it were barred from the highway its only value would be as junk; that it would be "impracticable" to take the crane apart and reassemble it and that to do so would require the assistance of another crane.

The court held that the state has paramount authority and control over its highways; that no one has an absolute and unqualified right to use them; that in the exercise of its police powers the general assembly has the power to limit or prohibit the use of the state highways by any kind of vehicle if such limitation or prohibition is reasonably necessary to save the highway from injury or to provide for the public safety and general welfare, and that even though such regulation may result in a restriction of liberty of contract or use of private property, there is no invasion of any guarantee of the Constitution of the United States or of the Constitution of Illinois.

Moffat Tunnel Commission Reorganized

At a meeting of the Moffat Tunnel Commission in Denver on Nov. 4, Herbert Fairall was elected president and George F. Schumacker second vice-president. Both men were recently appointed by Governor Adams, Mr. Fairall replacing William P. Robinson, who died two years ago, and Mr. Schumacker filling the vacancy caused by the resignation of Charles MacAllister Willcox.

A financial statement given out revealed that nearly $1,000,000 of tunnel tax collections is on deposit in various banks but cannot be disbursed as interest to bondholders, pending final determination of the suit testing the validity of $8,750,000 supplemental bonds issued by the commission to finance completion of the James Peak bore.

WASHINGTON NOTES

By Paul Wooton

Washington Correspondent

U. S. Departments Study Schedules of Existing Work to See if Extra Money Can Be Spent to Advantage

FOLLOWING the President's announcement that he will recommend to Congress an emergency appropriation to speed up public work as an aid to the unemployment situation, the secretary of war stated that army engineers are making a survey of their work to determine the amount of additional money they can use efficiently. Until it is known just where the work can be expedited to the greatest advantage, the war department will not be in a position to specify the additional appropriations that it can use.

In all probability the same procedure will be followed in the other executive departments. Before a definite sum is fixed upon for increasing the extent of the operations, studies will have to be made of the schedules of the existing work. It was pointed out in the President's announcement that the executive departments were previously authorized to undertake necessary technical preparation for future construction work which was authorized but for which no appropriations had been made.

The rivers and harbors bill enacted at the last session authorized projects that will require the expenditure of $148,000,000. Under normal conditions not much more than $55,000,000 would be provided in the new war department appropriation bill for the river and harbor work during the next fiscal year. It is believed that the river and harbor appropriations will be increased to $80,000,000 because of the President's desire to intensify public work.

As a result the appropriations available during the present fiscal year for construction work by the federal government will be increased to more than $500,000,000. The emergency appropriation that will be requested will be in the nature of an addition to this already enlarged program and will be in anticipation of such construction work as would normally have taken place a year or two hence.

Flood-Control Report to Be Expedited

In order to complete the final work on the President's flood-control report, army engineers who recently toured the lower valley with the Mississippi River Commission have hastened back to Washington to assemble the material obtained during their trip. Col. Ernest Graves, a member of the commission, who has been in active charge of much of the flood-control work, was back in his office at the war department last week. He stated that the Mississippi River Commission devoted particular attention to the plans submitted by Louisiana engineers for eliminating the Boeuf floodway.

Because of the extreme low water this year, the work on the Bonnet Carré spillway has progressed at a faster rate than was expected and satisfactory progress also is being made on most of the other work, Colonel Graves said. Because of the President's desire to provide as much employment as possible by means of public work, investigations were made during the trip to determine to what extent the flood-control work can be speeded up to afford additional jobs.

The views of the Mississippi River Commission will be made a part of the special report on the flood-control project. It is now realized that this report will be far more comprehensive than it was supposed originally. When the report was asked for by the President, it was thought that it would include only a restatement of the facts brought up to date regarding the controversial features of the existing plan. However, as the result of the depression and the attention that has been given to extensive development programs for public work, many new features have been added to the flood-control situation. Outside engineers have proposed an ambitious program of straightening the river; this and other recent proposals will be discussed in the forthcoming flood-control report.

Southern Railway Protests Barge Line on Illinois River

The plan of the Inland Waterways Corporation to extend its operations to the Illinois River, on which application is pending before the Interstate Commerce Commission, has brought forth a vigorous protest from the Southern Railway System. The railroad contends that the difficulties which rail carriers now are experiencing are due primarily to a lack of traffic and that, as the proposed new barge line will develop no new traffic, the amount of traffic moved by barge will decrease the traffic of the railroads by a like amount. The railroad states that with the 20 per cent differential under the all-rail rate the barge line would have a complete monopoly to the exclusion of the all-rail routes on all traffic which it is physically able to transport. The Southern contends that if the railroads are to be required to join in the establishment of through routes and joint rates with barge lines, such rates should be reasonable. A 20 per cent differential is not necessary to attract traffic to the barge line, in the opinion of the Southern, which insists that, in the absence of convincing proof that economy of transportation in connection with the barge lines justifies a differential of that amount, a smaller differential should be perscribed by the commission.

The Business Outlook

As the country impulsively mobilizes its generosity to tide over a hard winter by improvised dole systems and roundabout inflation, business is sliding further into the final stages of depression, under the weight of still unbroken financial fatalism, business inertia and popular fear. The strange and disturbing thing about the situation is that those who can least afford to take any chances or make any sacrifice are being exhorted to take the initiative of investing their uncertain purchasing power in business restoration, while those upon whom the real responsibility rests are not taking any. The public is responding to "Buy Now" campaigns and demonstrating the latent consumptive capacity of the market, but neither business enterprise nor financial support are forthcoming to reciprocate this gesture of confidence by supplying the goods, and thereby justifying it through expanding employment.

—The Business Week, Nov. 12.

Brief News

The Steel and Concrete Bridge across Duck River, near Centerville, Hickman County, Tenn., on Highway No. 100 was dedicated on Armistice Day.

The Revised Building Code proposed for the city of New York will be ready in about twelve weeks, it is announced. Only two subdivisions out of eighteen remain for final approval.

U. S. Army Engineers, co-operating with a crew provided by the Okeechobee control district, have begun a survey on which plans are to be made for works of navigation and flood control in the Lake Okeechobee and Caloosahatchee River drainage areas in Florida.

The Motor Express Highway on the West Side of New York City, which has been finished between Canal and 22d Sts., will be formally opened on Nov. 13, at which time the highway will be thrown open to motor passenger traffic.

Echo Dam, an earthfill structure being built in Utah by A. Guthrie & Co. for the U. S. Reclamation Service, has been completed with the exception of a parapet wall on the upstream side of the crest and a curb wall on the downstream side. These will be constructed next summer, after the reservoir is filled and settlement has taken place.

Construction of the first unit of a breakwater ultimately to provide smooth water anchorage for 1,200 pleasure craft has been started at Santa Monica, Calif., by the Santa Monica Harbor Co., Ltd. Taggart Ashton is the engineer in charge of design and construction. The project is expected to cost $2,500,000 and the plans call for its completion in 1932.

Lievre River Development Nears Completion

The large new newsprint mill of the James Maclaren Co., Ltd., recently erected at Masson, Quebec, at a cost of $6,000,000, is in operation, bringing to fruition one of the large developments being carried out by the Maclaren Company on the Lievre River, a stream which discharges into the Ottawa River about 20 miles east of the city of Ottawa. During the past two years a great program of development has been under way, consisting chiefly of the newsprint mill at Masson, a new hydro-electric development at High Falls, about 30 miles up the river, and a storage dam at Cedar Rapids, still farther up the stream. The High Falls station, now nearing completion, will have an initial installed capacity of 90,000 hp., with provision for an ultimate installation of 120,000 hp.

Personal Notes

A. B. STONE has been appointed bridge engineer of the Norfolk & Western Railway Co., with headquarters at Roanoke, Va. He takes the place of L. L. Kelly, deceased.

WILLIAM OGDEN has been appointed manager of the manufacturers' division of the Affiliated Bureau, established in connection with the general offices of the Associated General Contractors of America in Washington, D. C.

HARVEY B. FLEMING chief engineer of the Chicago Surface Lines, has been elected president of the Chicago City Railway Co., one of the constituents of the former concern, to succeed the late Leonard A. Busby.

RALPH D. HAYES, of Albany, has been appointed New York state commissioner of canals and waterways. Mr. Hayes has been acting commissioner since February, when he was given provisional appointment to succeed Thomas F. Farrell, who was promoted to the post of state engineer on the death of William M. Acheson.

THERON M. RIPLEY, who, as chief engineer, has supervised the construction of the Greater Motorways system in Erie County, N. Y., which has included the repaving and widening of main radial highways leading to Buffalo and the construction of three loops circling the city, has announced that he will retire from public life on Jan. 1 and establish a private business.

STUART F. KOSTER and FRANCIS L. SEARWAY have joined the Boston office of the Stone & Webster Engineering Corporation as engineers in the appraisal division. Previously Mr. Koster was for 11½ years with Swift & Co. interests in St. Joseph, Mo., and Mr. Searway was associated as appraisal engineer with the Shell Eastern Petroleum Products Co., Forstall, Robinson & Luqueer, and Lockwood, Greene & Co.

Obituary

T. COLEMAN DU PONT, pioneer in advocacy of good roads in Delaware, died in Wilmington, Del., on Nov. 10 in his 67th year. He had retired from active life two years ago. Mr. du Pont was the chairman of the first state highway commission in Delaware and in 1915 he built at his own expense a 100-mile road and presented it to the state.

FRANK L. GETMAN, deputy state engineer of New York State in 1907-08, died on Nov. 6 in Havana, Cuba, where he had been in business for 25 years. Mr. Getman was graduated from Cornell in 1893 as a civil engineer, and early in his career was chief engineer of the Ithaca water board. When he retired from the service of the state, he went to Havana as city engineer, but for several years he had been a distributor of American motor trucks and cars in that city.

EDWARD WYLLYS HYDE, for 25 years professor of mathematics at the University of Cincinnati and former dean of the university faculty, died on Nov. 4 at his home in Cincinnati. He was 87 years old. Professor Hyde, after his return from the Civil War, was graduated from Cornell University as a civil engineer. He became instructor of civil engineering at Cornell and later professor of mathematics at Pennsylvania Military Academy and the University of Cincinnati. On leaving the university he became treasurer and actuary of the Columbia Life Insurance Co., serving until he retired in 1920.

Society Calendar

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS, Washington, D. C.; annual meeting, Pittsburgh, Pa., Nov. 17-20.

AMERICAN ROAD BUILDERS ASSOCIATION, Washington, D. C.; annual convention and road show, St. Louis, Mo., Jan. 10-16.

ASPHALT PAVING CONFERENCE, New York City; ninth annual conference, Memphis, Tenn., Dec. 1-5.

NATIONAL ASSOCIATION OF RAILROAD AND PUBLIC UTILITIES COMMISSIONERS, New York City; annual meeting, Charleston, S. C., Nov. 12-15.

CALIFORNIA SECTION, American Water Works Association, held its eleventh annual convention in Pasadena Oct. 29 to Nov. 1. Among those who addressed the convention were George H. Fenkell, of Detroit, Mich., president of the American Water Works Association; H. A. Van Norman, chief engineer and general manager of the bureau of water-works and supply, Los Angeles; Samuel B. Morris, chief engineer and superintendent of the Pasadena water department; and F. E. Weymouth, chief engineer, Metropolitan Water District of Southern California. Officers elected were: president, W. W. Hurlbut, Los Angeles; vice-president, W. F. Goble, Alhambra; secretary-treasurer, E. W. Green, San Jose.

IOWA SECTION, American Society of Civil Engineers, at its annual meeting at Des Moines, Iowa, Nov. 20, will discuss local sections, student chapters and the proposed revision of the Iowa registration law. Papers will include "The Mississippi Waterway," by Prof. F. A. Nagler, Iowa State University, and "Causes and Cures of Frost Damage to Highways," by C. L. Motl, assistant maintenance engineer of the Minnesota department of highways.

He was the author of many books, among them "Skew Arches," "Directional Calculus" and "A Portion of Higher Mathematics."

THOMAS G. GERDINE, who had charge of topographic and geodetic surveys in the Pacific division of the U. S. Geological Survey, died recently in San Francisco. He was 58 years old. Mr. Gerdine was graduated from the University of Georgia and began work with the Geological Survey in 1894. He was transferred to the General Land Office in 1896, but returned to his original work in 1897.

ARTHUR W. THOMPSON, former president of the Philadelphia Company of Pittsburgh and former head of the United Gas Improvement Co., Philadelphia, died on Nov. 9 in Pittsburgh at the age of 55. Mr. Thompson was graduated from Allegheny College, Meadville, Pa., in 1897 with the degree of civil engineer. For nearly twenty years he was connected with the Baltimore & Ohio Railroad and in 1908 became general manager of the system. In 1919 Mr. Thompson left railroading and entered the utility field as president of the Philadelphia Company and its affiliated companies, which form the major public utilities of Pittsburgh and its vicinity. After seven years he went to Philadelphia as head of the U.G.I. Co. In 1929 he became a consulting engineer, with offices in Philadelphia.

LOUIS LINCOLN TRIBUS, commissioner of public works of the Borough of Richmond, New York City, from 1902 to 1913, died on Nov. 9 in his 66th year. After receiving his engineering degree at New York University in 1885 Mr. Tribus spent two years with Samuel R. Bullock & Co., constructors of water-works systems, and then returned to his alma mater as instructor and acting professor in the school of civil engineering, remaining until 1890. For eight years thereafter he was in private practice as a consultant on problems of civil and hydraulic engineering and then established the firm of Tribus & Massa, consulting engineers, in New York City, of which he had been the senior member ever since.

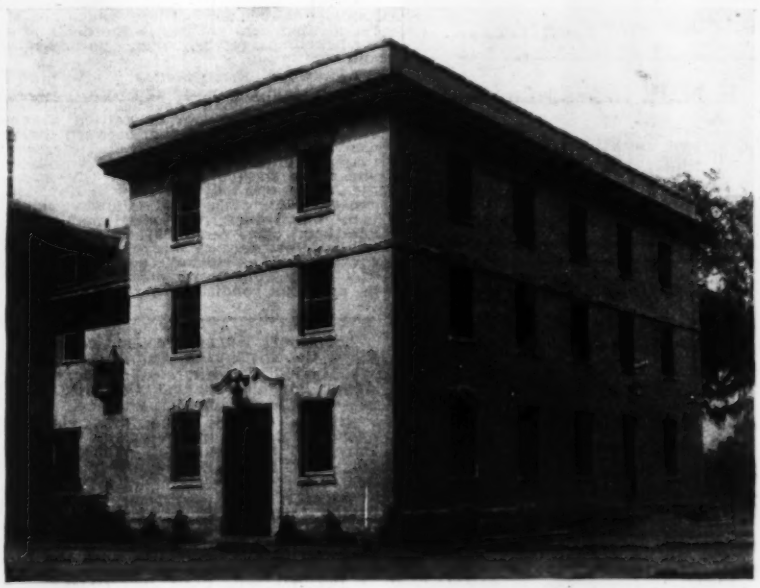
JAMES T. WALLIS, for nearly 40 years associated with the motive power department of the Pennsylvania Railroad and since 1927 assistant vice-president in charge of operation, died on Nov. 7 at his home near Philadelphia. He was 62 years old. Mr. Wallis attended the University of Louisiana, Georgetown College and Stevens Institute, being graduated from the last named in 1891. In that year he began service with the Pennsylvania Railroad and in 1911 became superintendent of the West Jersey & Seashore Railroad. In the following year he was made general superintendent of motive power of the Pennsylvania Railroad, with headquarters at Altoona. Nine years later he was promoted to be chief of motive power, with supervision over the power department of the entire system.

Construction Equipment and Materials

Research Laboratory Opened

Apparatus for development and research work in metals, foundry sand, cement and pipe coatings for the United States Pipe & Foundry Co. is housed in a recently completed three-story wing of the administration building at the Burlington, N. J., plant. On the ground floor is an entrance lobby and the physical laboratory, containing apparatus for testing materials in compression, tension, and for impact and hardness. There are also two electric furnaces and a number of machine tools for preparing the specimens. The second floor houses a library and several offices. On the third floor are the chemical department, provided with constant temperature ovens, refrigerators and other special apparatus; a metallographic laboratory with equipment for examining and photographing the structure of metals magnified up to several thousand diameters; photographic dark rooms and printing apparatus; a laboratory for the study of cement; and a sand-testing laboratory. In the latter it is possible to determine the moisture content of sand in a period of from two to four minutes by means of electrical and air currents passing through a sand core.

In the basement of the building ample space is available for special work. This is now being used for the study of various pipe linings applied to whole sections of pipe. By means of mechanical agitation accelerated tests are indicating the relative life of each type, and its effect upon water in the pipe. Space on the flat roof is utilized for exposing metal specimens to the corrosive effects of weather. The entire physical layout of the laboratory has been so arranged that those engaged upon research and development work can obtain test data with the least possible delay. It is in charge of F. L. Langenberg, director of research, who has previously been connected with the Watertown Arsenal and the Central Alloy Steel Co.



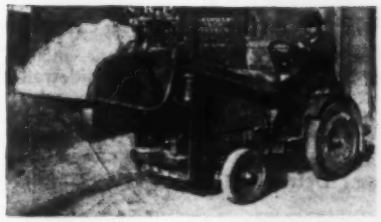
RESEARCH LABORATORY AT BURLINGTON, N. J.

New Developments

Shovel or Snow Plow Mounted on Light Gasoline Tractor

The Clark Tructractor, a gasoline-powered industrial tractor with standard truck transmission, multiple disk clutch and Clark truck axle, is used as the basis for two new pieces of equipment announced by the Clark Tructractor Co., Battle Creek, Mich. One of these is a hydraulic power scoop designed to handle any loose, fluid material such as sand, gravel or cement. This is equipped with a standard bucket holding 9 cu.ft., or 1,500 lb. The size of the bucket is varied in accordance with the weight of the material to be handled. Improved hydraulic cylinders enable the driver to pick up and hold the load at any desired point. Two models are available with different heights, one having an under-bucket clearance (in dumping position) of 3 ft. 9 in., the other of 6 ft. 5 in.

For the prompt removal of snow from platforms, runways and similar areas, the Tructractor can be equipped

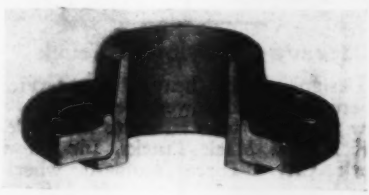


SMALL POWER SHOVEL

with a snow-plow blade controlled by means of a worm and pinion. This blade has a renewable cutting edge of special hardened alloy steel. When lowered, it rides on two steel buttons which prevent the edge of the blade from striking minor irregularities. It is 82 in. long and cleans a path 74 in. wide.

Bolted Joint for Welded Pipe

A new type of joint known as the Merco swivel flange has been developed by the Merco Nordstrom Valve Co., 343 Sansome St., San Francisco, Calif., for use on welded pipe lines where such a joint is required for the insertion of valves and fittings. This joint is a



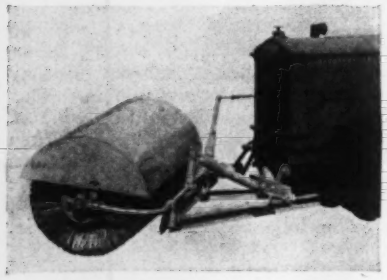
SWIVEL FLANGE PIPE JOINT

unique device, possessing, according to the manufacturers, the inherent flexibility of the Vanstone type of flange, plus the strength of an ordinary butt-welded flange. It consists of a drop forged steel flange fitted to a drop forged tapered nipple on which the flange may be rotated, permitting alignment of bolts. The finished product has a thickness much greater than that of the pipe at the base of the nipple, where highest stress occurs. Being formed completely at the proper forging temperature, possibility of a fracture of the metal is minimized. The manufacturer states that by forging from a solid billet sufficient heat is stored up in the steel to permit finishing at the correct forging temperature.

This swivel flange offers an additional advantage where service requires a special alloy such as the new chrome nickel steels. For such service the tapered nipple only is forged from the alloy, while the flange is forged from ordinary steel—which permits a less costly flanged joint. The tongue-and-groove type of construction can also be incorporated when desired. These flanges can be furnished with pipe nipples of various lengths welded on before leaving the factory. The manufacturer is arranging production in sizes from 1½ to 10 in., with specifications to meet American standards.

Sweeper Attachment for Tractor

General street-cleaning work, including the clearing of snow from sidewalks and streets, is the function for which a brush attachment for Cletrac 20 tractor has been developed by the Detroit Harvester Co., 5450 West Jefferson Ave., Detroit, Mich. The attachment,



SWEEPER BRUSH ATTACHMENT

which weighs less than 700 lb., can be mounted without alteration to the tractor. The brush is revolved by means of a front-end power take-off, and is raised or lowered by a hand lever. The standard brush is 6 ft. long, placed at an angle of 35 deg., and will clean a space approximately 5½ ft. wide.

Heavy Six-Cylinder Truck

Designed for heavy-duty service where speed and power are essential, a new truck has been added to the model AK line of Mack Trucks, Inc., New York City. Three standard wheelbase lengths are available, 174, 186 and

SIX-CYLINDER TRUCK, TRACTOR TYPE

198 in., with final drive by either chain or inclosed gears. The transmission box in all models, driven through a single-plate dry-type clutch, contains four speeds forward and one reverse. Service brakes are of the internal expanding type on all four wheels, actuated through a vacuum booster. The hand brake operates on the drive shaft. Other chassis features include rubber shock insulators, semi-elliptic two stage helper springs and steering of the worm and nut type. The six-cylinder motor used has a bore of 4½ in. and a stroke of 5½ in., developing 126 hp. at 2,200 r.p.m. Pistons, of the invar strutted type, are of aluminum. Smooth running at all speeds is assured by the use of a casehardened, drop-forged crankshaft with integral counterweights and a vibration damper. Lubrication is of the force feed and splash type, all oil passing through a filter. Water circulation is by centrifugal pump.

Business Notes

WISCONSIN MANUFACTURERS of road-building machinery on Oct. 15 staged an open air exhibition of their products for the benefit of road-building experts of 23 nations who visited the city after attending the International Road Congress at Washington, D. C. The products of 24 manufacturers were on display.

NATIONAL CARBON CO., INC., carbon sales division, Cleveland, Ohio, has taken over the distribution of the entire line of Gredag lubricants manufactured by the Acheson Graphite Corp., a unit of the Union Carbide & Carbon Corp.

INDEPENDENT PNEUMATIC TOOL CO., Chicago, Ill., announces the election of Charles W. Pendock to the board of directors. Mr. Pendock is president of the LeRoi Co., Milwaukee, Wis. He succeeds the late William A. Libkeman.

FEDERAL CEMENT TILE CO., Chicago, Ill., has acquired the American Cement Tile Mfg. Co. Executive and general offices will be at Chicago, with plants at Hammond, Ind., Lincoln, N. J., Wampum, Pa., and Birmingham, Ala. It is proposed to change the name of the company to Federal-American Cement Tile Co.

PACIFIC COAST CEMENT CO., Seattle, Wash., has announced that depletion of stocks and orders on hand make it possible to forego the usual mid-winter suspension of operations, both at the quarry in Alaska and at the plant in Seattle. Last year the Seattle plant suspended operations for 75 days during the winter season.

FORT PITT BRIDGE WORKS CO. has been formed by consolidation of the Fort Pitt Bridge Co., Pittsburgh, Pa., and the Massillon Bridge & Structural Co., Massillon, Ohio. The combined companies will have an annual capacity of 125,000 tons of structural bridge steel. Officers of the new company are: Theodore A. Straub, president; H. R. Blickle, vice-president; P. B. Straub, secretary-treasurer.

CAMPBELL INDUSTRIAL WINDOW CO., INC., Pershing Square Building, New York City, has been organized to manufacture industrial windows and doors for every type of installation and service requirement. Milton T. Clark, formerly vice-president of the Truscon Steel Co., is president of the new company, which is a subsidiary of the American Radiator & Standard Sanitary Corp.

HIBBARD-EICHMAN-SMITH, INC., is the new corporate name of the organization formerly known as Bacon-Hibbard-Eichman, Inc., Cleveland, Ohio. Effective Nov. 1 Harvey W. Smith, of Canton, joined the organization as vice-president and manager of the Canton branch.

INLAND STEEL CO., Chicago, Ill., through its employees has developed a plan for the relief of workmen for whom no employment can be provided under present conditions. Those who are working have voluntarily pledged a portion of their earnings to a relief fund, to which the company will contribute an equal amount. Employees' contributions vary from 2 to 5 per cent, those earning less than $125 per month not contributing when they have dependents. The money so collected will be distributed through trained social workers, acting as advisers to a central committee of employees. Expenses of distribution will be borne by executives of the company.

DOW CHEMICAL CO., Midland, Mich., has appointed Willard H. Dow president and general manager to succeed the late Herbert H. Dow.

HERCULES MOTORS CORP., Canton, Ohio, has appointed two new distributors: the Hedge & Mattheis Co., Boston, Mass., and Cyril J. Burke, Detroit, Mich.

BROCKWAY MOTOR TRUCK CORP., Cortland, N. Y., announces the appointment of M. L. Kerr as chief engineer. The Chicago branch has moved to new and larger quarters at 3913 South Michigan Boulevard.

J. H. WILLIAMS & CO., Buffalo, N. Y., has awarded contract for a 30,000-sq.ft. addition to its factory to be used for additional heat-treating facilities and also for finishing, assembling and storing standard stock products.

WESTINGHOUSE TRACTION BRAKE CO., Wilmerding, Pa., has appointed two new representatives to handle the sale of Westinghouse-National air compressors. C. D. Brown will be located in the Philadelphia district and O. W. Swartz in the Southwest territory at Dallas, Tex.

PORTLAND CONCRETE MACHINES CO., formerly of Chicago, has moved its headquarters to 4519 Hamilton Ave., N. E., Cleveland, Ohio. The company distributes a complete line of ready-mixed concrete plant machinery and also conducts an engineering and consulting service in the ready-mixed concrete field.

JOSEPH T. RYERSON & SON, INC., Chicago, Ill., is arranging a series of meetings in the principal cities of the country at each of which G. Van Dyke, manager of the special steels department, will give a talk and demonstration on the subject of alloy steels, tool steels and stainless steels. The lectures, of a non-technical character, cover the better part of a day and are given in such a way as to be clearly understandable by superintendents, shop foremen, welders and others who may not have had technical training.

CARRIER CORP. has been formed as a holding company to conduct sales, research and engineering activities for a consolidation including the Carrier Engineering Corp., Newark, N. J., the Brunswick-Kroeschell Co., New Brunswick, N. J., and Chicago, Ill., and the York Heating & Ventilating Corp., Philadelphia, Pa. Including subsidiary and affiliated concerns, the merger will unite fifteen companies, five of them foreign, with total assets of approximately $15,000,000. These companies will retain their own entities in the fields of air conditioning, refrigerating, unit heating and ventilating.

LAKEWOOD ENGINEERING CO., since its consolidation two years ago with the Jaeger Machine Co., has devoted considerable study to the problem of getting greatest efficiency and co-operation between the two companies. It has been decided that eventually manufacturing will be consolidated under one roof, at Columbus, Ohio, where the Jaeger plant is located. On Nov. 1 the general sales office of the Lakewood company was transferred to Columbus, where additional office facilities had already been built. New factory space is now under construction, and complete transfer of manufacturing from Cleveland to Columbus will be made as conditions demand.

Cost and Contracts

E. N.-R. Index Numbers

Cost			Volume	
Nov. 1, 1930	198.54	Oct., 1930	211
Oct. 1, 1930	198.72	Sept., 1930	232
Nov. 1, 1929	208.46	Oct., 1929	273
Average, 1929	207.02	Average, 1929	317
Average, 1928	206.78	Average, 1928	287
1913	100.00	1913	100

This Week's Contracts

Heavy construction contracts, reported by *Engineering News-Record* in the week of Nov. 13, with some comparisons, total as follows:

(In Thousands of Dollars)

	Nov. 13, 1930	Average of Last Four Weeks 1930	1929
Buildings:			
Industrial ...	$13,447	$6,125	$21,555
Other	21,674	25,853	30,989
Streets and roads.	9,008	7,660	7,886
Other eng. constr..	28,175	14,347	13,689
Total	$72,304	$53,985	$74,120
Total, all classes Jan. 1 to Nov. 13:			
1930			$2,922,997
1929			3,695,040

ADDISON H. BEALE, president of the A. M. Byers Co., Pittsburgh, Pa., died on Oct. 28.

CHARLES A. IRVIN, vice-president of the Alpha Portland Cement Co., died at his home in Chicago on Oct. 29.

EUGENE OBERLY SANGUINET, vice-president and sales manager of the William S. Barnickel Chemical Co., Webster Grove, Mo., died in St. Louis on Nov. 4 at the age of 58.

WILLIAM PIEZ, European correspondent of the Link-Belt Co., Chicago, Ill., and a brother of Charles Piez, chairman of the board, died at Brussels, Belgium, on Nov. 2. Previous to his association with the Link-Belt Co., Mr. Piez was district manager of the Concrete Steel Co., Chicago. He had been stationed at Paris, France, since 1928.

Unit Prices From Current Construction Bids

Reinforced-Concrete Bridge in Los Angeles

WASHINGTON St. bridge over the Los Angeles River in Los Angeles is a reinforced-concrete structure of five 62-ft. spans, 56-ft. roadway and two 5-ft. sidewalks on concrete piers resting on concrete piles. In addition to constructing the bridge, the contract includes fills in the approaches and abutments, a bituminous pavement on the approach fills and on the concrete deck of the bridge, storm drains, ornamental railings, pylons and standards.

Concrete is proportioned as follows:

Class	Cement, Sacks	Sand, Cu.Ft.	Rock, Cu.Ft.
D	1	4	8
F	1	2	3
H	1	2¼	2¼

In class H, calcium chloride solution may be used as an admixture to the mixing water in proportion of three to five pints per sack of cement. This concrete is for handrails and in the ornamental pylons above sidewalk level. Class D is used for concrete backfill; class F for the structure and the piles.

The mixing plant is to have capacity for producing 200 cu.yd. of concrete per eight-hour day. Transportation may be by overhead cableway, industrial railway, towers and chutes, or buggies; but the concrete must be deposited in a deck hopper before placing in the structure. If chutes are used the minimum slope is 5 in. vertical to 1 ft. horizontal. The equipment must permit the placing of concrete having a 2-in. maximum slump in the footings, abutments or other massive work. Concrete for the deck may be placed directly from buggies, but for columns and walls with heavy reinforcement placing is by a sectional pipe provided with a hopper at the top. Each batch must be thoroughly tamped and puddled before the next is placed.

Compressive test for cement is 2,000 lb. after 7 days, 2,400 lb. after 28 days. Sand is graded as follows: 0-6 per cent passing 100-mesh; 17-42, a 30-mesh; 60-85, a 10-mesh; 100, a ¼-in. mesh. River sand is used for fills. The contractor provides one sand bin and four rock bins as follows: (1) pea gravel; (2) ¼ to 1 in.; (3) 1 to 1½ in.; (4) for rock or plaster sand. Rock to 2½ in. may be permitted in the massive portions of the structure.

The unit price for concrete includes sufficient excavation (including removal of water) to permit placing of footings, piers, abutments and walls, the removal of sheetpiling, falsework and forms, and backfilling, and grading to original ground level. Form boards for showing faces is select common Douglas fir. Tongued-and-groved lumber must be equal to grade C fir flooring. Other form lumber and centering is No. 1 common.

The plans show 174 and 222 concrete piles respectively under the two abutments, and 70, 70, 76 and 84 under the four piers. The piles may be precast or cast in place. Test piles are paid for at the rate of $1.50 per linear foot in place, which includes cutting off. The accompanying tabulation gives two unit prices on each pile item, for precast and cast in place. Bids are based on 16-ft. lengths. Prices are given for increase or decrease in length, but for increase the price may not exceed $2.50 and for decrease not less than $1.50. Precast piles ordered but not driven will be paid for at cost plus 15 per cent and belong to the city.

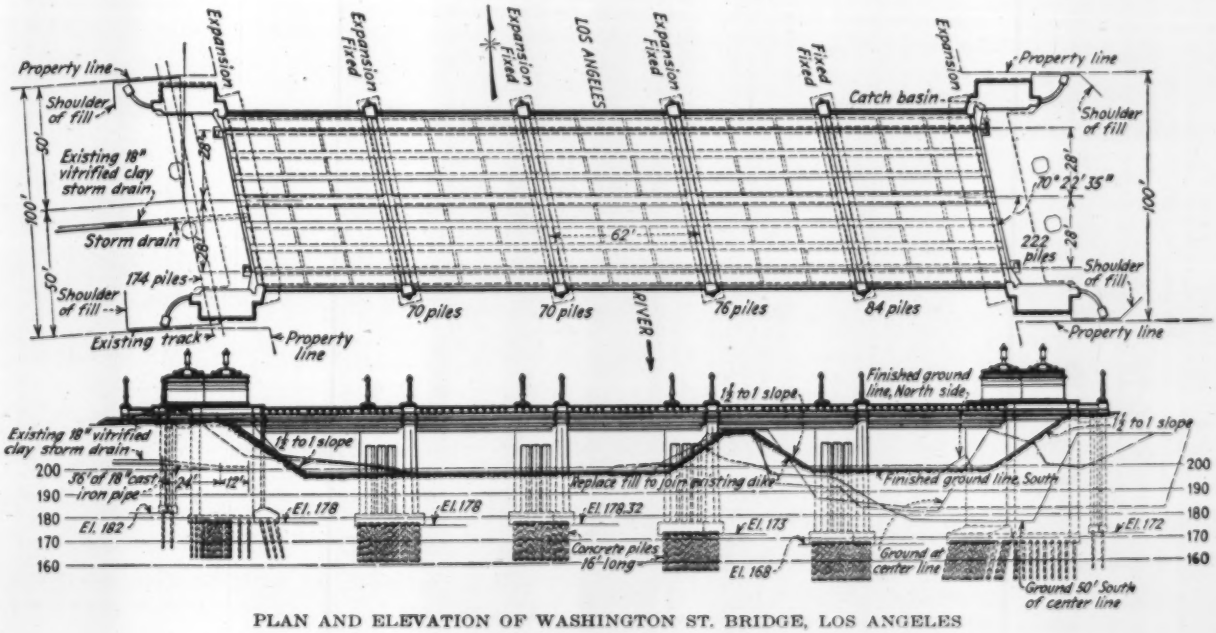
Each pier footing is poured in one operation. The shaft of each pier is placed to the bottom of the top girder in one or two pours. The top girder, including end posts to the top of the sidewalk, is poured continuously to full width and depth. Footing for the east abutment, including pylon base footing, is poured in not more than four operations; for the west, in not more than three.

Deck spans adjacent to the abutments are not poured until abutment backfilling is completed. The entire roadway section between construction or expansion joints, including the longitudinal girders and diaphrams, are poured in one operation. Girder forms are given a camber of 1¼ in. before use.

Construction joints below the finished grade are painted with asphalt or a standard asphaltic composition. Inside surfaces of the railway troughs are mopped with hot asphalt.

Fills and backfills for retaining or abutment walls may be of sand or earth, and may be made up to ground surface, simultaneously front and back, immediately after the forms are removed. No other fills may be made earlier than ten days after the removal of the stem forms. For a distance of 10 ft. back of walls the fills are made as follows: For 0.4 the height of the wall the fill is flooded; above this the fill may not be made for 25 days after completion of the wall, and where possible is made in 6-in. layers and rolled; otherwise in 4-in. layers. Payment is included in the lump sum for grading.

Roadway of the bridge over the railway troughs is paved with 5-in. asphaltic-concrete base and 3-in. asphaltic wearing



PLAN AND ELEVATION OF WASHINGTON ST. BRIDGE, LOS ANGELES

	A	B	C
Reinf. steel in place	$28,600	$28,000	$33,400
Class F. conc. (6,975 cu.yd.)	15.20	16.50	16.50
Reinf. conc. piles in place:			
Precast	.....	26,000	27,840
Cast in place	23,000	26,000	24,000
Cost per lin.ft. of increased pile length (not to exceed $2.50):			
Precast	.....	2.50	2.50
Cast in place	2.07	2.50	2.30
Price per lin.ft. for decrease in length (not less than $1.50):			
Precast	.....	1.50	2.30
Cast in place	1.50	1.50	1.80
Name of pile used	Raymond	Raymond	Raymond
Grading complete	20,000	20,000	11,000
Storm drains and appurtenances in place	800	800	5,100
Pavement in place	10,600	11,000	11,600
Ornamental conc. hand rail and pylons, in place	8,400	7,000	8,750
Ornamental lighting standards and units:			
Bronze	7,500	7,100	6,100
Aluminum	6,900	6,300	5,500
Extra machine excav. inc. backfill and haulaway (not to exceed $1.25 per cu.yd.)*	1.25	1.25	.70
Totals	$204,320	$214,187	$214,437

*Each bidder must submit a bid for this extra work item, which will be given due consideration in awarding the contract. If this extra work is ordered, the basis of payment will be the price bid, but not to exceed the maximum indicated in the parentheses.

surface not less than 3 in. thick. On the approach fills the pavement is 6-in. asphaltic-concrete base and 2-in. surface.

The bids are lump sum for (1) reinforcement in place except for steel in handrails and pylons above sidewalk level or for steel in piles; (2) reinforced-concrete piles in place; (3) grading, including cuts and fills for steelwork, fills back of walls, and finishing grading for pavement; (4) constructing storm drains; (5) pavements; (6) ornamental concrete handrails and pylons in place; (7) bronze lighting standards and units, with alternate bids for aluminum. Unit prices are given for (1) class F concrete, including forms, excavation and backfilling; (2) change in length of piles; (3) machine excavation, not to exceed $1.25 per cubic yard, including backfill and haulaway, in connection with street work.

Quantities composing lump sum bids not listed in the specifications are as follows: (1) 830,000 lb. reinforcing steel [under (1)]: (2) pavement, 12,364 sq.ft. total, equal to 2,390 tons of asphaltic concrete; (3) storm drains, 4 catch basins complete and 36 ft. of 18-in. c.i. pipe; (4) grading, 41,000 cu.yd. of fill; (5) ornamental, 623 lin.ft. of handrail (66 cu.yd.), 4 pylons (200 cu.yd.), 10 posts (29 cu.yd.), 12 lighting standards complete and 4 lighting units for pylons.

Complete prices are given of the lowest three bidders: A, General Engineering Corp., 740 South Broadway (contract); B, Oberg Bros.; C, J. Scarlett. Merrill Butler is engineer of bridges and structures, Los Angeles. H. P. Cortelyou is engineer of construction. J. J. Jessup is city engineer.

Dredging Intercoastal Waterway in North Carolina

SECTION III of the intercoastal waterway from Beaufort to Cape Fear River is between New River and the causeway at Wrightsville, N. C., a distance of 35.66 miles. Work consists of dredging a channel 12.5 ft. deep at m.l.w., with a bottom width 90 ft. and side slopes 1:3, and the removal of a causeway and of a trestle bridge. From New River the cut runs southwest through marine marshes 1 to 2 ft. above m.l.w., in which are many small, shallow channels. This section is divided into two portions: (1) 14 miles southwest; (2) 17.83 miles northeast. It is expected that the northeast portion will be completed by Nov. 1, 1931; but the dredge will continue until within 500 ft. of the dredge on the southwest portion. Removal of the causeway at Wrightsville, on the southwestern portion, must start by Oct. 10, 1930, and dredging Oct. 15. Progress is 143,975 cu.yd. the first month, and an average of 350,000 per month thereafter. In the northeast portion, the rate is 163,020 cu.yd. the first month, and 400,000 averaged thereafter.

Most of the proposed cut is covered by marshes, the remainder being in open water. Borings every 1,000 ft. show a mixture of sand and mud, with occasionally some shell and yellow clay. Disposal is on government right-of-way 1,000 ft. wide and the length of the cut. Material is pumped an average distance of 700 ft. from center line of cut. Berms 100 ft. wide are left on both sides to prevent filling in by dredging.

Unit price on the southwest portion is $0.06 per cubic yard place measurement, for 5,568,975 cu.yd.; cost $334,240. On the northeast portion the price is $0.053 for 6,363,000 cu.yd.; cost $337,240. Major W. A. Snow is U. S. district engineer.

Concrete and Asphalt Road in Syracuse

VALLEY DRIVE, Syracuse, N. Y., is being widened and resurfaced from the old city line to Seneca Turnpike, a distance of 3,544 ft. The existing concrete roadway, to be taken out, is 17 ft. wide and was paralleled on the north by a single trolley track, now removed. New pavement 30 ft. wide will be 8-in. concrete, 1:2½:5, with a 3-in. petroleum asphalt wearing surface of 1½-in. binder and 1½-in. wearing course, bordered with Medina sandstone curbing. During the year a sewer and a brine line serving the Solvay Process Co. were laid throughout the length of this contract. Over these trenches the pavement will be reinforced with steel rods.

Alternate bids were asked on granite or Medina curb and on sheet asphalt or asphaltic concrete, using natural lake or petroleum asphalt. Among the items common to the project are the following, with lowest three bids on each:

	A	B	C
Number of days at $50	40	55	70
3,000 sq.ft. plain conc. sidewalk	$0.20	$0.20	$0.25
1,000 sq.ft. plain conc. driveway	.32	.30	.35
20,000 lin.ft. reinf. rods	.04	.05	.06
30,000 sq.ft. mesh reinf	.02½	.04½	.04

Lowest three total bids on the group of common items were: A, G. B. Dickison, Union Bldg., Syracuse (contract), $11,954.50; B, C. T. Hookway, $13,312; C, Syracuse Paving Co., $15,388.

Grading, 12,940 sq.yd., was a separate item, and the prices of the above three bidders were respectively 25c., 18c. and 30c. The alternate bids, and the totals, of these three bidders are listed. W. W. Cronin is deputy city engineer.

Curb	A	B	C
1,100 ft. curved granite	$1.95	$2.00	$2.05
6,060 ft. straight granite	1.69	1.70	1.85
Total price	$12,386.40	$12,502.00	$13,466.00
1,100 ft. curved Medina	1.90	2.00	1.95
6,060 ft. straight Medina	1.58	1.65	1.70
Total	$11,664.80	$12,199.00	$12,447.00
Asphalt, 12,940 sq.yd.			
Natural lake	2.85	3.15	3.00
Petroleum	2.70	2.80	2.75
Asphaltic Concrete, 12,940 sq.yd.			
Natural lake	2.70	3.00	2.80
Petroleum	2.55	2.70	2.67
Grand Total Using Petroleum Asphalt Sheet			
Common items	$11,954.50	$13,312.00	$15,388.00
Grading	3,235.00	2,329.20	3,882.00
Paving	34,938.00	36,232.00	35,585.00
Medina curb	11,664.80	12,199.00	12,447.00
Total	$61,792.30	$64,072.20	$67,302.00
Unit prices on 8-in concrete base	$1.65	$1.68	$1.70

Dredging in Providence Harbor

TWO bids were received in September for dredging to 31 ft. below m.l.w. 1,230,400 cu.yd. of mud in Providence river and harbor from Squantum to Fox Point. The area is 10,800x610 to 1,685 ft. and depths are 24 to 31 ft. along the sides and 27 to 31 ft. in the central portion. The site is landlocked; mean tidal range 4.7 ft.; working season April 1 to Dec. 31. A minimum of 85,000 cu.yd. must be removed each month. The dumping ground in Narragansett Bay averages 16 miles from the site. The two bids were 17.4c. and 18c. respectively, and the contract was awarded to the low bidder, the J. S. Packard Dredging Co., 1004 Turks Head Bldg., Providence, for $214,090. The other bid, 3½ per cent higher, was from Taylor & Pearson, Inc., Jersey City, N. J.

CONSTRUCTION NEWS

Some of the Week's Large Projects

For further details turn to the appropriate sections in this issue.

Location	Project	Cost	Status
Waterworks			
Ft. Wayne (Ind.)	Waterworks extension	$2,750,000	Proposed
Kansas City (Kan.)	Waterworks impvts	1,000,000	Proposed
Bridges			
Cincinnati	Bridge	1,721,002	Contract
Pennsylvania	Bridges and paving	1,157,320	Contract
Dams			
Springfield (Mass.)	Dam and watermains	5,000,000	Proposed
Excav. Dredging			
Biloxi (Miss.)	Seawall	3,500,000	Contract
Harlingen (Tex.)	Irrigation system	1,000,000	Proposed
Subway and Tunnels			
Long Island City (N. Y.)	Subway	5,328,921	Contract
Unclass			
Texas	Oil pipe line	2,000,000	Owners forces
Texas and Nebraska	Gas pipe line	4,000,000	Proposed
Fed. Govt.			
Quantico (Va.)	Barracks, etc	1,243,074	Contract
Fac. and Mills			
Martinez (Calif.)	Oil cracking plant	2,000,000	Contract
Power Plants			
Herndon (Calif.)	Generating plant	4,000,000	Owners forces
Shops and Fdrys.			
Pittsfield (Mass.)	Transformers tank shops	1,000,000	Contract
Warehouse			
Los Angeles	Warehouse, etc	3,500,000	Contract
Buildings			
Long Island City (N. Y.)	Apartment	1,200,000	Contract
New York	Y. M. C. A.	2,000,000	Bids asked
Newark (N. J.)	Office	8,000,000	Proposed
Paterson (N. J.)	School	1,700,000	Proposed
Denver	Theatres	1,000,000	Contract
Albany	Theatre	3,000,000	Contract
Davenport (Ia.)	Theatre and hotel	2,000,000	Contract

WATERWORKS

PROPOSED WORK

Conn., Hartford — City, Metropolitan Dist. Comn., C. A. Goodman, chn., issuing $200,000 bonds, extending waterworks.

Conn., New Britain — City, Water Dpt., extending service to supply East Berlin and Berlin. $15,000.

Ill., Columbia — Preliminary plans water softening plant, additional shallow well, new pump, also considering either remodeling present sewage disposal plant or a secondary plant. Russell & Axon, 6200 Easton Ave., St. Louis, Mo., engrs.

Ind., Ft. Wayne—City retained Hoad, Decker, Shoecraft & Drury, engrs., Ann Arbor, Mich., to prepare plans waterworks extensions, incl. 20 m.g.c. reservoir, filtration plant, pumping station building, chemical and clarifier building. $2,750,000.

Kan., Kansas City — Waterworks improvements, incl. 2 story, basement, 95 x 125 ft. addition to old Quaindaw Plant, 80 ft. high. $1,000,000. Burns & McDonnell Eng. Co., 400 Interstate Bldg., Kansas City, Mo., engrs.

Mass., Hanson — Town, Water Comn., G. Bowker, chn., extending mains. $85,000.

Mass., Marblehead — Preliminary plans extending waterworks. $75,000.

Mo., Cape Girardeau—Missouri Utilities Co., preliminary plans waterworks plant, no main extensions, Cape Rock, north of here. $232,000. Private plans.

N. J., Elizabeth—Bd. P. Wks. 30 in. main to connect with Newark Water System, at city line then along Newark Ave. to North Broad St. and to Prince St. $25,000 or more; 16 in. main at Race and Pearl Sts., to South St., Rosehill Pl. and Lidgewood Ave., to Bayway. $25,000 or more. T. Collins, city engr. Noted Oct. 23.

Okla., Beaver—Oklahoma Electric & Water Co. preliminary plans rebuilding distribution system, adding 350 g.p.m. pump. $20,000. D. W. Robinson, 1200 Texas St., Ft. Worth, Tex., engr.

Tex., Dallas — Preston Road Fresh Water Dist., c/o Bd. Supervisors, preliminary plans waterworks, c.i. mains, laterals, elevated tank and tower to furnish water for 5,500 acre district. $160,000-$170,000 bond election soon for same. Koch & Fowler, 801 Central Bank Bldg., consult. engrs.

Alta., Lethbridge—City Council, storm sewers in 8th and 9th Aves., $150,000; sanitary sewers, watermains in 1st Ave., $15,000. J. Haines, city engr.

Ont., Alexandria — Town soon takes bids water supply, incl. motors, pumps, etc. $20,000. S. Macdonnell, clk.

Ont., Guelph—City plans 6 in. mains, 8 in. vitr. sewers and diverting Pond Creek. $107,000. Work will probably be done by day labor. H. S. Nicklin, city engr.

Ont., Hamilton—City, making plans 12 m.g. (Imperial), waterworks reservoir, Mountain Ave. Constructing 30 in. c.i. main extension on Locke St., Mountain and Aberdeen Aves., in connection with above, day labor under supervision of W. A. McFaul, city engr. Total est. $564,000. Noted Sept. 11 and Oct. 23.

Que., Masson — Village, A. Mougeot, secy.-treas., soon takes bids watermains. $45,000. E. Gohier, 10 James St. E., Montreal, engr.

BIDS ASKED

Ark., Hot Springs — See "Contracts Awarded."

Calif., Santa Clara—Nov. 17, by S. A. Evans, city clk., furnishing, delivering 8,000-10,000 ft. welded steel water pipe, with min. tensile strength of 50,000 lb. per sq.in., 20 to 40 ft. per section. R. Fowler, city engr.

Mass., Attleboro—See "Contracts Awarded."

Mass., Fall River—Nov. 14, at City Auditor's Office, City Hall, water tank, Emmett St. $20,000.

Neb., Rushville—Nov. 20, by E. L. Curtis, city clk., 9,144 lin.ft. 4- to 8-in. c.i. pipe, 3 tons specials, 4 hydrants, 15 valves and boilers for 5½ ft. trench, labor for above pipe. 250 g.p.m. well, 125 ft. deep, 1 deep well turbine pump and motor, 1 brick or tile pump house.

N. Y., Brooklyn—Nov. 18, by J. J. Dietz, comr. Water Supply, Gas & Electricity, Municipal Bldg., New York, mains in Raymond Street Prison, Fort Greene Park, 52nd St. Pier, Village Rd., Polhemus and Lincoln Pls., Avenues O and W, Albany, Bushwick, Wyckoff, 28th, Autumn, Stanley, 5th, and Remsen Aves., Cook, 57th, East 73rd, North 9th, Hicks, Lake, Van Brunt, Willoughby, 1st, 22nd, 23rd, 47th, 52nd, 58th, 6th, East 1st, East 49th, East 58th, and East 92nd Sts., Brooklyn Boro.

N. C., Jonesboro—Nov. 18, by Town, drilling deep well. Spoon & Lewis, Greensboro, consult. engrs.

Okla., Holdenville — Nov. 25, by City, impounding reservoir 3 m.g. earth fill dam on Beemore Creek, 4,200 ft. 16 in. c.i. mains, overhauling present filter plant. $225,000. C. H. Edge, city engr.

Tex., Houston—Nov. 19, at office City Secretary, drilling, equipping 1 water well at Scott St. Water Plant. W. E. Monteith, mayor. Noted Oct. 9 and 16.

B. C., Richmond—Nov. 17, by S. Shepherd, clk., Municipal Hall, Brighouse, supplying 3- to 12-in. steel pipe, lead and yarn joints, coated and wrapped for 64 mi. mains. $400,000 incl. installation. Noted Sept. 4.

Ont., Cornwall—See "Contracts Awarded."

Ont., Hamilton—See "Proposed Work."

CONTRACTS AWARDED

Ark., Hot Springs — Citizens Electric Co., additional 500,000 gal. water reservoir and extending "White Way" lighting system on Malvern, Market and Benton Aves., own forces. All material bought.

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., exploration tunnels for San Gabriel Dam 1, to McGuire & Young, Central Bldg., $3,620; drilling 23 diamond drill holes for same, to F. G. Cannon, 4271 Lincoln Ave., Culver City, $10,403. Noted Oct. 23.

Calif., Los Angeles—Bd. P. Wks., City Hall, to Pacific States Cast Iron Pipe Co., Subway Terminal Bldg., 30,000 ft. 6 in. c.i. pipe at $0.645 per ft.; to National Cast Iron Pipe Co., 846 South Bway., 30,000 ft. 6 in. c.i. pipe, $0.65; to American Cast Iron Pipe Co., 412 West 6th St., 30,000 ft. 6 in. cam c.i. pipe $0.65, 30,000 ft. 8 in. c.i. pipe $0.657; to United States Pipe & Fdry. Co., Monadnock Bldg., San Francisco, 10,000 ft. 6 in. c.i. pipe $0.61, 20,000 ft. 8 in. c.i. pipe $0.91, 10,000 ft. 8 in. c.i. pipe $0.92.

Calif., Los Angeles—City, to Santa Fe Pipe & Supply Co., 2451 East 15th St., wrought steel pipe delivered 1 car load per month, commencing Jan. 1, Spec. 2202, incl. 9,000 ft. ¾ in. at $6.04, 3,000 ft. 1 in. $8.61, 1,000 ft. 1¼ in. $11.66, 500 ft. 1½ in. $13.94, 1,000 ft. 2 in. $18.75, 200 ft. 3 in. $38.78 all standard pipe, T. & C. 3,500 ft. ¾ in. $8.03 and 10,000 ft. 1 in. $11.15, both extra heavy pipe, plain ends, 500 ft. 1½ in. $19.77 and 1,000 ft. 2 in. $26.90, both extra heavy pipe, T. & C.

Calif., Los Angeles—City, furnishing welded steel pipe, incl. 6,720 ft. 54 in. (11/32 in.) 1,176 ft. 54 in. (5/16 in.) and 10,548 ft. 40 in. dipped in McEverlast, Inc. steel pipe coating, Spec. 2213, to Western Pipe & Steel Co., 5717 Santa Fe Ave., $110,191.

Calif., San Francisco — Bd. P. Wks., A. Hester, secy., 12.7 mi. welded pipe line from Newark to San Lorenzo connecting with East Bay Municipal Dist., to prevent water shortage, to Western Pipe & Steel Co., 444 Market St., San Francisco, $648,867. Noted Oct. 9.

Kan., Augusta — Reservoir dam, concrete work, to E. D. Reagor, Augusta, $29,163; earth work, to Martin Day Co., 312 Little Bldg., Lincoln, Neb., $28,325. Est. $130,000. Noted Oct. 9.

Ky., Louisville — Louisville Water Co., replacing old filters with mechanical filters, incl. considerable inside concrete work, to Pittsburgh Constr. Co., Diamond Bldg., Pittsburgh, $139,700. Noted Oct. 9.

La., Kenner — Bd. Comrs. East Jefferson Water Dist. 1, J. W. Hecker, pres., Divs. 7, 8 and 9, 3 m.g. clear water reservoir, filter plant building, head house, pumping station building, grit mixing and coagulation basins, to P. Oliver & Son, Lake Charles; Div. 11, river intake works, to Scott & Bres, Maritime Bldg., New Orleans. Noted Nov. 13.

Mass., Attleboro—City, Dpt. P. Wks., City Hall, water lines, drains, bituminous macadam surfacing Emory and Pine Sts., day labor. Est. $50,000.

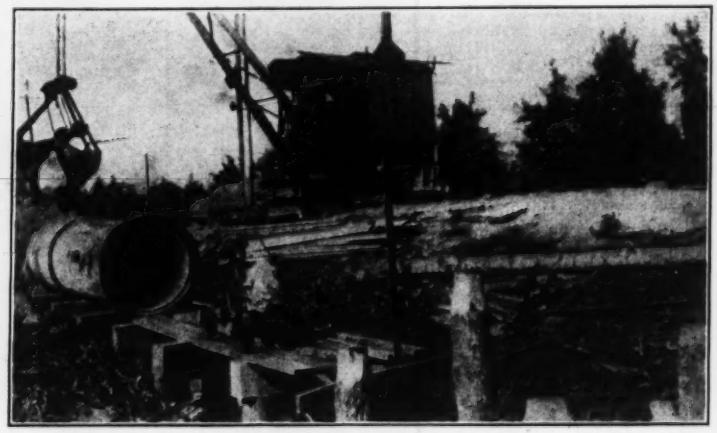
See proposal advertising on page 105

Constr. News page 195

LEADITE

Trade Mark Registered U.S. Pat. Office

New Bedford uses LEADITE for laying new c.i. water lines through swampy country... *with great success*



Laying 48-in. c. i. bell and spigot water pipe with Leadite Joints, at New Bedford, Mass.

In 1921 the Water Department of the City of New Bedford, Mass., started to lay a new line of 48-in. cast iron bell and spigot pipe. This first section was 18,813 feet long.

In 1928, an additional extension to this line of 2561 feet of 48-in. c.i. bell and spigot pipe was laid.

The New Bedford Water Department has just finished another addition to the line of 6700 feet,—which runs through cedar swamp land. This presented a tremendous problem, as explained in an interesting article in the September 10th, 1930, issue of "Water Works Engineering," by Mr. Stephen H. Taylor, Superintendent of the Water Department, New Bedford, Mass.

It is a significant fact, that LEADITE was used exclusively as a jointing material for this entire difficult and interesting installation. (This pipe line was installed by their own forces.)

Remember,—"thousands of miles" of water mains have been satisfactorily jointed with LEADITE,—under all conditions of earth and climate, etc.

The pioneer self-caulking material for c.i. pipe.
Tested and used for over 30 years.
Saves at least 75%.

THE LEADITE COMPANY
Land Title Building - - Philadelphia, Pa.

No Caulking

Waterworks (Continued)

Mass., Framingham—Town, A. C. Winch, chn. Bd. P. Wks., concrete pumping station and equipment at Reservoir 1, Winter St., to T. A. Sheehan, 403 Union Ave. Noted Nov. 6.

Minn., Minneapolis—F. S. Gram, city purch. agt., 152 tons special castings for Water Dpt., to Diamond Iron Wks., 2nd St. and 18th Ave. N., at $89.50 per ton. Noted Oct. 16.

N. J., Ventnor (br. Atlantic City)—Bd. City Council, City Hall, sinking well, constructing pump and electric motor for extension, waterworks, to F. Glick, Ventnor, $19,100.

N. J., Ventnor (br. Atlantic City)—Bd. City Council, City Hall, 300,000 gal. elevated steel tank, 122 ft. high for water supply storage, to Tippett & Wood, Phillipsburg, $13,640. Noted Oct. 23.

N. Y., Brooklyn—J. J. Dietz, comr. Water Supply, Gas & Electricity, Municipal Bldg., New York, mains in Waverly Ave., to J. Deliso, $8,640; Jefferson St., to Atlas Water Wks. Corp., $9,767; Bedford Ave., to Sareno Contg. Co., $9,137. Grand total $27,544. Noted Oct. 23.

N. Y., Long Island City—J. J. Dietz, comr. Water Supply, Gas & Electricity, Municipal Bldg., New York, main in 32nd Pl., to S. Gallucci, 31 Railroad Ave., Corona, $3,702. Noted Oct. 23.

N. Y., New York—Bd. Water Supply, G. J. Gillespie, pres., 346 Bway., 5 ft. sluice gates, for uptake chambers, Hillview Reservoir, Contr. 231, to Whiting Corp., Harvey, Ill., $44,183. Noted Oct. 16.

N. Y., New York—J. J. Dietz, comr. Water Supply, Gas & Electricity, Municipal Bldg., main in Amundson Ave., to L. D. Gregory, 158 26th St., Brooklyn, $11,240. Noted Oct. 23.

O., Cincinnati—Hamilton Co., Water Supply Line 145, Dists. 1, 2, 4, 7 and 9, 40,387 ft. 6- to 10-in. c.i. pipe, to M. F. Quill & Son, Provident Bank Bldg., $71,214. Est. $82,272. Noted Oct. 9.

Texas and **Missouri**—Phillips Petroleum Co., Amarillo, Tex. and Bartlesville, Okla., drilling 15 water wells along route of new gas pipe line between Borger, Tex. and St. Louis, Mo., via Wichita and Kansas City, to D. L. McDonald, Amarillo, Tex., $100,000.

Tex., Brownsville—City, c/o R. B. Renfro, mayor, 2 story, brick, rein.-con. 4 m.g. purification plant, incl. sedimentation basin with 12 hr. capacity and 1 or 5 American or rapid type with department for chemical testing, to Carrothers Constr. Co., 6803 East 39th St., Kansas City, Mo., $129,175. Est. $150,000. Noted Oct. 9.

Ont., Cornwall — Town, 2 mi. 20 in. mains from west to east limits of town, day labor, $100,000. J. H. Harkness, town clk. takes bids Dec. 1 for pipe.

Ont., Hamilton—See "Proposed Work."

Ont., Westboro—Nepean Twp., to McDougall Bros., Ottawa, force mains, Contr. B, $9,850; to Grant Bros., Ottawa, east trunk sewer, Contr. C, $15,436, main trunk sewer, Contr. D, $28,792, west trunk sewer, Contr. E, $52,942; to H. Hayley, Ottawa, sewer pipe, $17,264; to A. Fleck, Ottawa, c.i. pipe, $24,257; to T. Lanson & Sons, Ottawa, valves, hydrants, $3,130. Grand total $151,672. Noted Oct. 23.

SEWERS

PROPOSED WORK

Calif., Redwood City—San Mateo Co., Coloma Sewerage System, incl. vitr. pipe, $130,000. G. A. Kneese, Court House, co. surv. Noted Jan. 30.

Calif., Westmoreland—Westmoreland Sanitary Dist., 20,000 lin.ft. 8- to 10-in. vitr. sewers, manholes. Currie Eng. Co., Anderson Bldg., San Bernardino, engrs.

Ia., Mason City — Preliminary plans storm sewerage system northwestern section city. $91,000. O. H. Stevens, City Hall, engr.

Mass., Springfield—Extending sewerage system. To exceed $25,000. Metcalf & Eddy, Statler Bldg., Boston, engrs.

Minn., Duluth—J. Wilson, city engr., soon takes bids sewers in Rogers Blvd., 42nd, Rendle, 47th, and 48th Aves., House, Superior, Bowser and 8th Sts., for City, $63,887.

N. J., Ventnor (br. Atlantic City)—Joint Bd. City Council, City Hall, Margate City, revised plans joint municipal sewage disposal plant, on Shelter Island. $400,000. E. D. Rightmire, 530 Guarantee Trust Bldg., Atlantic City, engr. Noted Nov. 6.

Pa., Grove City—Boro sewage disposal plant. **Maturity next summer.** F. P. Graham, Grove City, engr.

Pa., Sharon — Sewage disposal plant along Shenango River, south of Mill St. **Maturity probably in couple of years.** L. E. Burnside, city engr.

Tex., Fort Worth—City, c/o O. E. Carr, mgr., soon takes bids moving 1,800 ft. 36 in. concrete sanitary sewer in Fournier St. $25,000. D. L. Lewis, city engr. Hawley, Freese & Nichols, Capps Bldg., consult. engrs.

Ont., Brampton—Town, new concrete sewage disposal plant, in south end of town. $60,000-$75,000. If new plant is not built, will probably reconstruct present works, $40,000. F. C. McClory, Brampton, engr.

Ont., Toronto—City, 1¼ mi. probably circular brick and concrete trunk storm sewer in Rosedale Ravine from Yonge St. to Don River, $761,000. R. C. Harris, City Hall, engr.

Que., Masson—Village, A. Mougeot, secy. and treas., soon takes bids sewerage system, $40,000. E. Gohaier, 10 St. James St. E., Montreal, engr.

BIDS ASKED

Calif., Los Angeles—Nov. 24, by Supervs. Los Angeles Co., 29,710 ft. in. vitr. sewers, 12,110 ft. 8 in. and 1,160 ft. 10 in. vitr. sewers on concrete cradle, 32,450 ft. 6 in. vitr. house sewers, 47 flushing manholes, 81 manholes, etc. for Graham Unit 4, Baird Ave.

Calif., Redondo Beach—Nov. 22, by C. C. Mangold, city clk., 13,500 lin.ft. sewer, incl. 1,300 ft. tunnel, manholes, flushing manholes, junction chambers on various streets.

Mass., Boston—Nov. 17, by Dpt. P. Wks., sewerage works in Mt. Vernon St.; Nov. 20, in Old Colony Parkway. $25,000. J. A. Rourke, comr. Dpt. P. Wks.

Mass., Norfolk — Nov. 17, at office State Prison Colony, 6,000 lin.ft. 12 in. outfall sewer, and 2,200 lin.ft. 10 in. trunk sewer at State Prison Colony. B. F. Snow, 6 Beacon St., Boston, engr.

Minn., Minneapolis—See "Contracts Awarded."

N. J., Holmdel—Nov. 24, by C. H. Leathem, Jr., state archt., State Office Bldg., Trenton, reception and treatment hospital, at State Hospital, for Dpt. Institutions & Agencies, Trenton. To exceed $500,000.

N. Y., Yonkers—Dec. 12, by Westchester Co. Sanitary Sewer Comn., 2 mi. trunk sewer mostly 78 in. tunnel, Sect. G, Sawmill Project Sewer Tunnel from Lake Ave. to Locust St. E. S. Martin, secy.; adv. E. N.-R. Nov. 13.

Okla., Nichols Hills (Oklahoma City, P.O.)—Nov. 18, by T. A. Montague, town clk., sanitary main sewers $50,000; sanitary lateral sewers $70,000; storm sewers $60,000. Former bids rejected. Benham Eng. Co., Perrine Bldg., Oklahoma City, engrs. Noted July 17.

Utah, Salt Lake City — Nov. 20, by City Comn., 43,912 lin.ft. 8- to 30-in. vitr. tile or concrete sewer in section between 21st and 28th South Sts., West Temple and 15 East Sts. $150,000. H. Jessen, city engr.

Ont., Lindsay—See "Contracts Awarded."

Ont., Toronto — Nov. 14, by York Twp., electrically driven blower unit at Rockcliffe Blvd. Sewage Disposal Plant. $58,000. Gore, Nasmith & Storrie, Confederation Life Bldg., engrs. Noted Oct. 30.

CONTRACTS AWARDED

Calif., Long Beach—See "Streets and Roads."

Calif., Los Angeles—Bd. P. Wks., City Hall, sanitary sewers, house connections, resurfacing 109th Street and McKinley Avenue Sewer Dist., to J. Artukovich, 4928 West Blvd., $63,335. Noted Oct. 16.

Ill., Chicago—Bd. Local Impvts., City Hall, Devon Ave. Sewer, to L. Sculley, 4451 Nevada St., $598,445.

Ill., Collinsville—City, 34,222 ft. 6- to 15-in. sewer pipe, 1,764 ft. 2- to 16-in. c.i. pipe, 20,000 ft. rough yellow pine lumber, 111 manholes, 3 lampholes, sewage settling and sludge digestion tank, sludge drying bed, 40 rods steel wire fencing, 2 electric motor driven sewage pumping units, outfall abutments, in Sewer Dist. A, to Willadsen-Thompson, Peoria, $70,967. Est. $102,525.

Ill., Peoria — Bd. Trustees Peoria Sanitary Dist., 531 Peoria Life Bldg., 3rd section intercepting sewer, appurtenances, to Northern States Impvt. Co., Endicott Bldg., St. Paul, Minn., $123,478. Est. $150,000. Noted Sept. 25.

Ind., Oaklandon—Bd. Comrs. Marion Co. sewage disposal plant at Sunnyside Tuberculosis Hospital, to W. C. Martin, 3551 Carrollton St., Indianapolis. Est. $26,000.

Ky., Louisville—Bd. Comrs. of Sewage, 400 M. E. Taylor Bldg., Beals Branch Trunk Sewer, Sect. A, Contr. 49, 3,570 lin.ft. 10 ft. 3 in. rein.-con. semi-elliptical sewer, outlet structures, manholes, to M. P. Smith Constr. Co., Avondale Tunnel, Chattanooga, Tenn., $178,000. Noted Sept. 11.

Ky., Louisville—Commissioners of Sewerage, M. H. Crawford, clk., 400 M. E. Taylor Bldg., 4th and Jefferson Sts., Goss Avenue Sewer from Eastern Parkway and Beargrass Creek to Poplar Level Rd., Contr. 51, incl. 180 lin.ft. 60 in., and 200 ft. 45 in. rein.-con. circular, 1,428 ft. 54 in. plain or rein.-con. circular, and 390 lin.ft. 36 in. plain concrete sewers, manholes, connections, to George M. Eady Co., 340 Byrne St., $34,741. Noted Oct. 10.

Ky., Louisville—Commissioners of Sewerage, 400 Marion E. Taylor Bldg., Peachtree St. Sewer, to Fry & Kain, Lansing, Mich., $169,964. Noted Oct. 9.

Md., Baltimore—Bd. Awards, sanitary sewers in Storm Water Contr. 266, to Angelozzi Contg. Co., Everall St. and Mayberry Ave., $19,326.

Md., Baltimore—Bd. Awards, Highlandtown Drainage Pumping Station, 1 story, 29 x 42 ft., brick, stone, concrete, to De Cou & Chidlaw, 857 North Eutaw St., $19,739.

Minn., Minneapolis—Trunk sewer in Oakland Ave., Richfield Dist., and 2nd Ave., south sewer terminal, day labor. $92,500. C. Ilstrup, sewer engr.

New Jersey — Joint Meeting Cities of East Orange, Newark and Summit, Towns of Irvington and West Orange, Village of South Orange and Hillside, Milburn and Union Twps., at City Hall, Newark, constructing portion Sect. 1, Supplementary Joint Trunk Sewer from Clifton St. through various streets and right-of-way to Allen St. and Carolina Ave., to D. and M. Contg. Co., Maplewood, $427,168 est. $500,000; portion Sects. 1 and 2, Supplementary Joint Trunk Sewer, from Allen St. and Carolina Ave. to Monmouth Rd., to Northern States Contg. Co., 312 Endicott Bldg., St. Paul, Minn., $420,431 est. $500,000. Noted Nov. 6.

O., Cincinnati—Hamilton Co., 17,130 ft. 6- to 12-in. vitr. clay sewers, for Sanitary Sewer 87, Dists. 4 and 5, to Crumley, Jones & Crumley, Temple Bar Bldg., $35,084. Est. $44,769. Noted Oct. 16.

O., Cleveland — Cuyahoga Co., culvert and sewer, 1,130 ft. 60 in. concrete pipe, in S. O. M. Center Rd. relocation, to Green Mills Constr. Co., 175 Woodrow Ave., Bedford, $19,847. Est. $26,129.

Wis., Milwaukee—Sewerage Comn., furnishing steel, 1 story, 102 x 205 ft. sludge storage for sewage disposal plant, to Milwaukee Bridge Co., 1410 34th St., $18,945; erecting steel, to Milwaukee Structural Bridge Co., Watertown Rd., $2,995; superstructure, to Worden Allen Co., Port Washington Rd., $56,500. Grand total $78,440. Noted Oct. 17.

Wis., Milwaukee—Sewerage Comn., erecting steel and superstructure 3 story, 70 x 150 ft. dryer house, at sewage disposal plant, Jones Island, to J. Lorenz, Vliet St., $52,300. Noted Oct. 10 Daily.

Wis., Milwaukee—Dpt. P. Wks., to Wisconsin Sewer Constr. Co., 946 30th Ave., sewer and water service connections in North 31st St. $983, West Keefe Ave. $1,858; to Wenzel & Henoch, 5025 State St., North 52nd St. $4,499, North 53rd St. $5,096, North 55th St. $4,750, South 32nd St., $2,150; to Werner Co., 721 8th Ave., Wauwatosa, North 56th St., $4,227. Grand total $23,563. Noted Oct. 23.

Ont., Lindsay—Town, rein.-con. sewage disposal plant, tile sewer in East Ward, day labor under supervision O. Smith, engr., Lindsay, $45,000. Noted Oct. 23.

Ont., Sturgeon Falls—Town, furnishing 24- to 42-in. concrete pipe for storm relief sewer, to Dominion Lock & Joint Pipe Co., Glengrove Ave. W., Toronto; installation, to T. Baldasaro, North Bay. Est. $75,000.

WASTE DISPOSAL

PROPOSED WORK

N. Y., Troy—Dpt. P. Wks., A. E. Roche, comr., bids probably in March, incinerator, $150,000. Engineer not selected.

O., Cincinnati—City, 3 incinerators. Total est. $300,000. **Maturity indefinite.**

Tex., San Antonio—Preliminary surveys drying plant for sludge from incinerator plant, $25,000. I. Ewig, city engr. J. Hughes, City Hall, asst. engr.

BRIDGES

PROPOSED WORK

Massachusetts — State Dpt. P. Wks., State House, Boston, concrete bridge, New Bedford and Fairhaven, $25,000. A. W. Dean, Dpt. P. Wks., Boston, engr.

New Jersey—Bd. Freeholders Cape May Co., Cape May, complete new creosoted timber trestle with 50 ft. Rall type double leaf bascule draw, on hy. connecting Cape May Court House and Stone Harbor. $25,000. R. Sharp, co. engr. This corrects report in Oct. 23 issue.

N. Y., Catskill—Dpt. P. Wks., A. W. Brandt, comr., Albany, 135 ft. cantilever bridge over Hudson River.

Okla., Aydelotte—State Hy. Dpt., Oklahoma City, preliminary plans 6 span 96 ft. concrete bridge, State Hy. 18, Pottawatomie Co. $35,000. A. R. Losh, hy. engr.

R. I., Providence—City, Bd. Contr. & Supply, soon takes bids concrete steel bridge, Eagle St. $25,000 or more. S. F. Nolan, City Hall, engr. Noted Aug. 21.

Ont., Kenora — Town, concrete bridges, approaches, 8th Ave., $20,000—1st Ave. S., $20,000—7th Ave., $5,000. H. T. Crosbie, Kenora, engr.

Que., Hull—Dpt. Hys., Quebec City, bridge over Gatineau River between here and Gatineau Point. $250,000.

BIDS ASKED

Ariz., Keams Canyon — Nov. 17, by Hopi Indian Agency, E. K. Miller, supt., timber bridges over Oraibi, Polacca and Keams Canyon Washes, K. L. Hudson, Holbrook, engr. Navajo Co., Holbrook. Noted Sept. 18.

Calif., Manzanita—Nov. 26, by C. H. Purcell, engr. State Hy. Comn., Sacramento, bridge to have 56 ft. plate girder lift span on concrete piers with pile found., 45 ft. steel stringer span on concrete bents with pile found., 2,340 ft. timber trestle on pile frame bents over Richardson Bay and Northwestern Pacific R.R., Marin Co.

Michigan — Nov. 19, by H. G. Rose, div. bridge engr., Grand Rapids, M Br. 1 of 70-7-1, Constr. 2, 2 rein.-con. abutments, steel deck girder, Ottawa Co., for State Hy. Comn., Lansing.

N. J., Mantoloking — Bd. Freeholders Ocean Co., Court House, Toms River, bids about Nov. 15, creosote timber bridge with jacknife draw across Barnegat Bay, from here to West Mantoloking. $250,000. H. C. Shinn, Municipal Bldg., Lakewood, co. engr. Noted Oct. 23.

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Bridges (Continued)

Ohio—Nov. 18, by R. N. Waid, dir. Hys., Columbus, four 90 ft. span, steel girder bridge, Sect. Painsville Bridge, Wicklieef-Madison Rd., Lake Co. $93,890.

CONTRACTS AWARDED

Calif., Los Angeles—Los Angeles Co. bridge over San Gabriel River at San Gabriel Canyon, to E. G. Perham, 1128 Stearns Dr., $25,000.

Calif., Los Angeles—Los Angeles Co., rein.-con. bridge over Alhambra Wash, Pomona Blvd., to Byerts & Dunn, 7908 Santa Monica Blvd., $19,970. Noted Oct. 16.

Illinois—State Dpt. P. Wks. & Buildings, Div. Hys., Springfield, bridges in DeWitt Co., to A. Edwards, Saunemin, $32,247—Cook Co., to M. J. McDermott, Chicago, $23,102—Route 140, Sect. 113-B and Route 140, Sect. 113-C Gallatin Co., to Vincennes Bridge Co., Vincennes, Ind., $44,416 and $15,475 respectively. Grand total $115,240. Noted Aug. 28.

Ind., South Bend — St. Joseph Co., Court House, 22 rein.-con. bridges, to J. B. McCarthy Constr. Co., Benton Harbor, Mich., to A. J. Gutschenritter, Buchanan, Mich., to B. A. Smith, Williamsport, to J. McCarthy, Benton Harbor, Mich., to H. Stroh, Garrett, Ind. Est. $59,075. Noted Oct. 2.

Kentucky—See "Streets and Roads."

Michigan—H. C. Fleming, resident engr., Grand Rapids, MBr. 1 of 70-6-1, Contr. 1, and MBr. 1 of 70-7-1, Contr. 1, to Whitehead & Kales Co., 2361 Beecher St., Detroit, $7,270 and $14,111 respectively; MBr. 1 of 70-6-1, Contr. 2, to Willitts Bros., Muskegon, $73,738 incl. cement; MBr. 1 of 70-7-1, Contr. 2, to Peninsula Constr. Co., Grand Rapids, $64,668, incl. cement, both in Ottawa Co., for State Hy. Comn., Lansing. Noted Oct. 9.

Minnesota—State Dpt., St. Paul, Bridge 3695, north of Preston and Bridge 3707, south of Chatfield, both concrete to Bland Eng. Co., 459 Northeast L St., Minneapolis, $27,771 and $20,314 respectively. Noted Oct. 2.

New York—A. W. Brandt, comr. Hys., Albany, new bridge, approaches on 0.07 mi. road, Niagara Co., to Eden Lumber & Supply Co., Eden, $17,650. Est. $25,040; 10 in. pipe line across South Bay in Washington Co., to Scott Bros. Constr. Co., Rome, $5,172. Noted Nov. 3 Daily.

O., Cincinnati—Cincinnati Union Terminal Co., H. M. Waite, ch. engr., Temple Bar Bldg., 58 span, 4,000 ft. rein.-con. bridge, Central Parkway to McMillan St., to MacDougald Constr. Co., 545 Angier Springs Rd., Atlanta Ga., for City and Cincinnati Union Terminal Co. $1,721,002. Est. $3,500,000. Noted Oct. 16.

O., Toledo—City, W. H. Schroeder, dir. Pub. Serv., strengthening, repairing bridge over Swan Creek, Summit St., to A. Bentley & Sons Co., 201 Belmont St., $66,425. Est. $70,000. Noted Oct. 2.

Pennsylvania — State Hy. Dpt., Harrisburg, split viaduct, north half being 9 plate girder spans equaling 395 ft., south half, 7 plate girder spans equaling 310 ft., one 52 ft. rein.-con. beam bridge, also 10,066 lin.ft. brick paving, Route 120, East Pittsburgh, North Braddock and Forest Hill Boros, to Herkner Co., 1445 East 49th St., Cleveland, O., $1,157,320. Noted Oct. 16 under "Streets and Roads."

Pa., Pittsburgh—J. G. Armstrong, chm. Bd. Comrs., Allegheny Co., superstructure West End North Side Bridge, 7 span, 1,889 ft., 780 ft. channel span, to American Bridge Co., Frick Bldg., $749,576, total est. $3,540,000—Kilbuck Run Bridges 2, 4 and 7, 1 span, incl. removal and disposal of existing bridges, to Welsh Constr. Co., 2331 Los Angeles Ave., $60,205—superstructures Boston Bridge, 6 span over Youghiogheny River, and South 10th Street Bridge, 4 span, 1,575 ft., over Monongahela River, both steel-concrete to Vang Constr. Co., Grant Bldg., $197,354 and $746,878 respectively total est. $900,000 and $2,000,000 respectively. Grand total $1,754,013. Noted Oct. 9.

Ont., Burlington—Dpt. P. Wks., Parliament Bldgs., Ottawa, moving Canadian National Ry. swing bridge over Burlington Channel to new location, to R. C. Huffman Constr. Co. Ltd., 331 Bay St., Toronto, $43,000.

STREETS AND ROADS

BIDS ASKED

Arizona—Nov. 26, by C. H. Sweetser, dist. engr. Pub. Rds., 461 Market St., San Francisco, Calif., grading, crushed rock surfacing 11.32 mi. Sects. G and H, Route 19, Clifton-Springerville Natl. Forest Hy., Apache Co.

California—Nov. 19, at office C. H. Purcell, engr. State Hy. Comn., Sacramento, grading, bituminous macadam surfacing 3 mi. road between Alto and Waldo, Marin Co.—grading, concrete surfacing 0.3 mi. road at Nojoqui Creek, Santa Barbara Co.—substructure of bridge 2 rein.-con. abutments, 2 rein.-con. piers, 6 concrete footings, 4 erection anchors over North Fork Feather River at Pulga, Butte Co.

California — Nov. 26, by State Hy. Comn., Sacramento, grading, asphaltic concrete paving 6 mi. Araz-Yuma Rd., Imperial Co.; grading, bituminous macadam paving 10.7 mi. road between San Felipe and point 1 mi. east of Belle Sta., Santa Clara Co. C. H. Purcell, P. Wks. Bldg., Sacramento, hy. engr.

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Calif., Long Beach—Nov. 21, by City Council, curbing, guttering, asphaltic concrete paving 163,500 sq.ft. and 4,004 tons "A" finish on Broadway between Alamitos and Junipero Aves.

Calif., Riverdale — D. M. Barnwell, clk. Fresno Co., Fresno, taking bids curbing, guttering, 3 in. Permanite asphaltic concrete surfacing 2,500 lin.ft. Mt. Whitney Ave., 45 ft. C. P. Jensen, Holland Bldg., Fresno, engr.

Georgia—Nov. 18, by B. P. McWhorter, engr., 325 State Capitol, East Point, limerock surfacing 11.3 mi. hy. Houston and Peach Counties.

Georgia—Nov. 25, by State Hy. Comn., East Point, paving 27 mi. Waycross-Brunswick Hy., Glyn and Brantley Counties, $550,000—20 mi. Macon-Brunswick Hy., Telfair Co., $65,000—12 mi. Waynesboro-Augusta Hy., Burke Co., $220,000—6 mi. Thomson-Augusta Hy., McDuffie Co., $120,000 — Cairo-Bainbridge Hy., Grady Co., $175,000—grading 10 mi. Camilla-Newton Hy., Mitchell Co., $65,000 — grading preparatory to paving on Avondale-Lithonia Hy., DeKalb Co., $100,000—bridge approaches on Waycross-Tifton Hy., Atkinson Co., $20,000—Athens-Macon Hy., Putnam Co., $8,000 — Atlanta-Cedartown Hy., Paulding Co., $6,000—Bankhead Hy. between Athens and Hartwell in Madison Co., $20,000—3 bridges on Athens-Augusta Hy., Oglethorpe Co., $40,000. B. P. McWhorter, East Point, engr.

Indiana — Nov. 21, by State Hy. Comn., Indianapolis **(F.A.P. means Federal Aid Project)**, grading, drainage structures, culverts, concrete paving 131,655 sq.yd. Roll-Bryant Rd., F.A.P. 220-A Jay and Blackford Counties — 117,429 sq.yd. Roll-Bryant Rd., F.A.P. 220-B Jay Co.—106,279 sq.yd. Hatfield-Rockport Rd., F.A.P. 229 Spencer Co.—69,275 sq.yd. Bloomfield-Bedford Rd., F.A.P. 161-A Greene Co.—96,834 sq.yd. Tipton-Alexandria Rd., F.A.P. 172-A Tipton and Madison Counties—76,317 sq.yd. Gary-Michigan City Rd., F.A.P. 193-A Lake and Porter Counties—112,087 sq.yd. Gary-Michigan City Rd., F.A.P. 193-B Porter Co. J. J. Brown, dir.

Ia., Sioux City — Probably take bids in spring and summer grading, drainage structures, curbing, 6 in. concrete paving. $700,000.

Kentucky — Nov. 26, by State Hy. Dpt., Frankfort, **(S.A.P. means State Aid Project and F.A.P. Federal Aid Project)**, grading, drainage structures 13.962 mi. Shepherdsville-Taylorsville Rd., S.P. 46-CG, Bullitt Co.—3.435 mi. F.A. 192-AG, Horse Cave-Bear Wallow Rd., Hart Co. — 9.592 mi. Hopkinsville-Lafayette Rd., S.A.P. 10-AG, Christian Co. — 5.649 mi. Flemingsburg-Carlisle Rd., S.A.P. 43-BG, Fleming Co.—4.316 mi. Leitchfield-Hardinsburg Rd., S.A.P. 136-AG, Grayson Co.—3.958 mi. Springfield-Perryville Rd., F.A.P. 220-AG, and 0.225 mi. Springsfield-Bardstown Rd., F.A.P. 222-AB, both Washington Co.—1.321 mi. Clinton-Columbus Rd., S.A.P. 7-EG, surfacing 9.406 mi. Clinton-Columbus Rd., S.A.P. 7-ES, substructure and 100 ft. steel superstructure bridge on Clinton-Columbus Rd., S.A.P. 7-EB, all Hickman Co. B. Johnson, chn.

Louisiana — Nov. 25, by State Hy. Comn., Baton Rouge, grading, shell and gravel surfacing 3.8 mi. Baton Rouge-Gay Hy., P. P-22-A, East Baton Rouge Parish—grading, shell surfacing 5.6 mi. Erath-Intracoastal Canal Hy., P. 748-A, Route 148, Vermillion Parish—grading, gravel surfacing 4 mi. Vixen-Intersection Route 17 Hy., P. 773-B, Route 200—8 mi. Columbia-Chatham Hy., P. 456-C, Route 17, both Caldwell Parish—15 mi. Oak Grove-Mer Rouge Hy., P. 190-B, Route 11, Carroll and Morehouse Parishes—3.8 mi. Cypress Island School Hy., P. 771-A, Routes 399 and 422, St. Martins Parish — grading, drainage structures 6.9 mi. Tannehill-Intersection Hy., P. 735-B, Route 231, Winn Parish. W. H. Norckauer, hy. engr.

La., Lake Charles—Nov. 17, by City Comn., 6 in. rein.-con. paving 7,683 sq.yd. F. Shutts, Lake Charles, engr.

Massachusetts — Nov. 18, by Dpt. P. Wks., Boston, A. W. Dean, engr., bituminous macadam paving 37,338 ft. by: Ashfield and Conway; 8,158 ft. Athol and Orange.

Mass., Attleboro—See "Contracts Awarded."

Mass., Boston—Nov. 17, by Dpt. P. Wks., J. A. Rourke, comr., sheet asphalt or bitulithic paving Firth Rd., Ward 19; Nov. 18, Colburg Ave., Ward 20. $25,000.

Mass., Boston—Nov. 18, by Dpt. P. Wks., J. A. Rourke, comr., grading, preparing site, Charles St. from Cambridge to Nashua St. Est. $25,000.

Mass., Boston—Nov. 19, by Dpt. P. Wks., sheet asphalt or bitulithic paving Donnybrook Rd., Ward 22. $25,000. J. A. Rourke, comr. Dpt. P. Wks.

Michigan—Nov. 18, by C. H. Brown, resident engr., 14380 Wyoming Ave., Highland Park, grading, shaping, drainage, concrete slab paving 0.438 mi. Assessment Dist. 474-B, Contr. 3, Oakland and Wayne Counties, for State Hy. Comn., Lansing.

Michigan — Nov. 25, by R. W. Roberts, resident engr., 504 Eddy Bldg., Saginaw, grading, shaping, drainage, concrete paving 6.951 mi. FO9-20-Contr. 1, Bay City, Bay Co., 20 ft., for State Hy. Comn., Lansing.

Minn., Duluth — Engineer St. Louis Co., Court House, soon takes bids concrete paving 4.5 mi. Becks Rd., 20 ft. **Maturity 1931.**

Miss., Gulfport—Nov. 20, by City Comn., resurfacing, repairing existing pavement 15th St. between 20th and 24th Sts. and 25th Ave., from Louisville & Nashville R.R. to 22nd incl. 530 tons asphaltic material for cold application in place, 800 sq.yd. concrete base place, 9,400 sq.yd. concrete paving. H. Shaw, Gulfport, engr.

Miss., Vicksburg—Nov. 17, by City Council, curbing, guttering concrete paving 11.8 sq.yd. 9 streets

New York—Nov. 24, by Westchester Co. Park Comn., 72 West Pondfield Rd., Bronxville, grading 4.5 mi. Taconic Parkway Connection Bronx Parkway Extension from Mohansie Park to Putnam Co. line, Contr. 330. J. Downing Bronxville, ch. engr.; adv. E. N.-R. Nov. 13.

N. Y., Brooklyn—Nov. 19, by H. Hesterberg pres. Brooklyn Boro. Boro Hall, grading, curbing, flagging, Stanley, Van Siclen, 14th and 27th Aves., Bradford, East 2nd, East 49th, Milford Sts.—grading, asphalt on concrete paving Van Siclen Ave., East 49th and 97th Sts.—sewers in Bay Ave. and East 51st St.

N. Y., Long Island City—Nov. 17, by G. T. Harvey, pres. Queens Boro, Queens Subway Bldg., grading, curbing, flagging, 40th Rd Rockaway Beach Blvd., 40th Ave.; grading curbing, sheet asphalt on concrete paving 42nd 50th, Garfield, 45th, Elmhurst, 14th (1st Aves., 103rd, 99th, 79th, 83rd (26th) and Grand Sts.

Ohio—Nov. 18, by R. N. Waid, dir. Hys., Columbus, grading, draining, slag surface treating 0.589 mi. hy. Lake Co. $48,309.

Pa., Dubuque — Nov. 17, by City, J. A. Hughes, supt. Streets & P. Impvts., grading, curbing, brick on 8 in. concrete paving Kennedy Ave. to Peter St. $80,000. R. F. Dell, City Hall, engr.

Pa., Phila.—Nov. 18, by Bureau Hys., Dpt. P. Wks., A. Murdock, dir., City Hall Annex. Schedule A, grading Merrick Rd., Shelborne and Tyson Sts.—Schedule B, asphalt paving (assessment work) Greenway, Josephine, Lincoln, Tabor and Unruh Sts.—Schedule C, redressed granite block repaving Glenwood and Water Sts.—Schedule D, asphalt repaving Wayne St. —Schedule E, country road improving Friendship and Tyson Sts.—Schedule F, furnishing, laying 34 tons 8 in. and 11 tons 6 in. c.i. water pipe, etc. in Olney Ave. from Ozone to 20th Sts. (assessment work).

Pa., Phila.—Nov. 25, by Bureau of Hys., Dpt. P. Wks., A. Murdock, dir., City Hall Annex. Schedule A, asphalt paving Large, Overbrook and Washington Sts.—Schedule B, improvement of (grading, paving, repaving, assessment work) Passyunk Ave. from Broad to Jackson Sts.—Schedule C, improvement of (grading, paving, assessment work) Olney Ave. from Broad to 20th Sts.—Schedule D, furnishing, delivering lumber for bridge work.

Washington—Nov. 25, by S. J. Humes, dir. Hys., Olympia, grading 4.2 mi. State Rd. 3, Wallula E. F.A.P. 169-D, Unit 1, Walla Walla Co. —0.7 mi. State Rd. 4, Republic Vicinity, F.A.P. 177-A, Ferry Co.—5.3 mi. State Rd. 8, Goldendale N. E., F.A.P. 162-C, Unit 1, Klickitat Co.—0.5 mi. State Rd. 9, North of Sunds Creek-Sect. 1, and Hidden Cove Revision-Sect. 2, Mason Co. —9.3 mi. State Rd. 9, from end of pavement to Sequim, F.A.P. 138-C, Clallam Co.—bridge over Little Klickitat River, State Rd. 8, F.A.P. 162-C, Unit 2, Klickitat Co.—bridge over Snoqualmie River, State Rd. 2, F.A.P. 142-G, King Co.

Wash., Issaquah—City Comrs., bids about Nov. 29, concrete sidewalks. $25,000. Gardner, Gardner & Fisher, Artic Bldg., Seattle, engrs.

B. C., Vancouver—See "Contracts Awared."

Ont., Hamilton—See "Contracts Awarded."

Ont., Sandwich — Bids about Nov. 20, by Essex Co., concrete paving Lauzon and Pike Rds., Malden Twp. $50,000. A. Knister, County Bldg., engr.

Ont., Toronto—See "Contracts Awarded."

CONTRACTS AWARDED

Ariz., Phoenix—Curbing, guttering, 6 in. concrete paving 11th St., McDowell, Almeria, Coronado Rds., to J. C. Steele Constr. Co., Phoenix, $24,907—12th and 15th Aves., Polk and Van Buren Sts., to Phoenix-Tempe Stone Co., Phoenix, $46,187 — McKinley St. and bituminous concrete paving 3rd St., to Pacific Coast Constr. Co., Homebuilders Bldg., $7,450 and $14,807 respectively. Grand total $93,351.

Arkansas—State Hy. Comn., Little Rock, 6 in. rein.-con. surfacing 1 mi. road through Ozark, to Merrill Constr. Co., Lamar Bldg., Jackson, Miss., $40,383. Est. $40,383.

California — State Hy. Comn., Sacramento, grading, asphaltic concrete surfacing 13.1 mi. road between Arroyo Salado and north boundary, Imperial Co., to Hazard Constructing Co., 2508 Kettner Blvd., San Diego, $489,125.

Calif., Long Beach — Curbing, sidewalks, sewers, 9-7-9 in. concrete on 4 in. disintegrated granite sub-base paving 265,000 sq.ft. Wardlow Rd. between Long Beach Blvd. and Cherry St., to Sully-Miller Contg. Co., 1500 West 7th St., $75,145.

Calif., San Francisco—S. J. Hester, secy. Bd. P. Wks., City Hall, improving Sect. C-Alemany Blvd., incl. vitr. clay pipe sewers, 54,000 gal. fuel oil for oiling sub-grade, slope planting, to J. Verano, 1648 Grant Ave., $21,863. Noted Oct. 23.

Ga., Cuthbert—R. A. Patterson, mayor, and Bd. Aldermen, City Hall, grading, curbing, guttering, vibrolithic concrete paving 10,272 sq.yd., to MacDougald Constr. Co., 189 Peachtree St., Atlanta. Noted Oct. 16.

Streets and Roads (Continued)

Idaho—J. D. Wood, comr. P. Wks., Boise, crushed graveling 10.242 mi. Raft River Hy., F.A.P. 131-B, Cassia Co., to Idaho Contr. Co., Boise, $43,842. Est. $56,972. Noted Oct. 16.

Idaho—J. D. Wood, comr. P. Wks., Boise, Oct. 21, grading 4.602 mi. Grays Lake Hy., Caribou Co., to Allsop & Pond, Grace, $14,793. Est. $18,725. Noted Oct. 16.

Idaho—J. D. Woods, comr. P. Wks., Boise, grading 2.197 mi. Lost River Hy., Custer Co., to Sutherland & Burns, Missoula, Mont., $15,805 est. $16,536—grading, crushed rock surfacing 1.726 mi. and crushed rock surfacing 0.823 mi. North and South Hy., Kootenai Co., and crushed graveling 8.009 mi. Yellowstone Park Hy., Fremont Co., to Wheeler & England, Moreland, $31,383 and $69,741 respectively, est. $45,860 and $71,932 respectively—bridge over Minidoka Canal, Cassia Co., to D. J. Cavanagh, Twin Falls, $14,994 est. $17,470. Grand total $131,923. Noted Oct. 23.

Illinois—State Dpt. P. Wks. & Buildings, Div. Hys., Springfield, paving Route 63, Sect. 632, to I. D. Lain, Park Ridge, $131,516—Route 5, Sect. 3W, to P. J. Crowley Co., Maywood, $41,670, both Cook Co.—Route 3, Sect. 298, to Monmouth Constr. Co., Monmouth, $3,965—Route 94-A, Sect. 118W, to F. F. Wier Constr. Co., Moline, $3,941, both Warren Co.—Stephenson Co., to Grund-Graham Co., Freeport, $4,048—Lake Co., to Waukegan Constr. Co., Waukegan, $1,701—DuPage Co., to Anderson & Son, Inc., Lombard, $9,076—Route 48, Sect. 123 and Route 48, Sect. 124, De Witt Co., to G. E. Hoffmann Constr. Co., Lincoln, $99,964 and $157,563 respectively. Grand total $453,444. Noted July 24 and Aug. 28.

Ill., Chicago—Bd. Local Impvts., City Hall, grading, curbing, guttering, 10 in. concrete paving Bryn Mawr Ave. and 8 in. concrete paving Heyden and Hulbert Sts., Ardmore, Hobart, Somerset, Northcott and North Natoma Aves., to James A. Sackley Co., 4608 Belmont Ave., $109,217 and $110,421 respectively — grading, curbing, guttering, sewers, 8 in. concrete paving South Kidvale Ave., to Ready Coal & Constr. Co., 205 West Wacker Dr., $37,745—North Harlem Ave., to J. M. Bransfield Co., 3525 South Leavitt St. $76,978—North Neva St., to Home Paving Co., 134 North La Salle St., $50,699—North Mulligan St., to J. A. Ross & Co., 4561 Armitage Ave., $65,475—North Mulligan, Balmoral and Berwin Aves., to Marquette Constr. Co., 5726 North Winchester St., $77,589—Oketa, Ogallah, Oriole, Olcott and Isham Aves., to Central Paving Co., 179 Washington St., $51,398—grading, curbing, guttering, sewers, 10 in. concrete paving East 87th St., to Farr Bros. Co., 356 West 111th St., $71,913—Damen Ave., to Hedges Constr. Co., 64 West Randolph St., $54,597—grading, curbing, guttering, sewers, asphalt on 6 in. concrete paving West 84th, 85th, 86th and South Lincoln Sts., South Hoyne, South Hamilton and South Winchester Aves., to R. F. Conway Co., 33 North La Salle St., $245,610—West 79th, West 98th and La Salle Sts., Harvard, Princeton, Yale, Perry, Lafayette, and Wentworth Aves., to American Asphalt Paving Co., 133 West Washington St., $319,942—grading, curbing, guttering, sewers, asphalt on 8 in. concrete paving West 61st St. and paving 51st St., to White Paving Co., 1735 Fullerton Ave., $350,090 and $54,510—South Laramie Ave., to Robert R. Anderson Co., 625 North Kedzie Ave., $32,287. Grand total $1,393,471. Noted Oct. 23.

Ind., Ft. Wayne — Allen Co., bituminous macadam surfacing 2.17 mi. Beek Rd. and 1.63 mi. Fahlsing Rd., to R. L. Harris, State Rd., $14,261 and $15,033 respectively ests. $23,290 and $23,256 respectively; concrete surfacing 3.895 mi. Hicksville Rd., to Grace Constr. Co., 903 1st Natl. Bank Bldg., $85,027 est. $110,591. Grand total $114,321.

Ia., Independence—Buchanan Co., gravel surfacing 9.25 mi. secondary roads, to G. E. Sargent Co., Hampton, $2,656—bridge fill on secondary roads, to Clear Lake Constr. Co., Clear Lake, $5,040—to E. N. Barker, Manchester, $880—and to W. O'Brien, Sr., $800. Grand total $9,376. Noted Oct. 23.

Kentucky—State Hy. Dpt., Frankfort, bank gravel surfacing 10.768 mi. roads in Carlisle Co., to C. Sargent, Middlebourne, W. Va., $22,524—traffic bound limestone surfacing 3.043 mi. Marion Co., to Perkins, Darnell & Williams, Hodgenville, $14,794—5.298 mi. Taylor Co., to J. F. Pace Co., Morrowbone, $28,631—6.017 mi. Ohio Co., to Corum Bros., Madisonville, $37,775—grading, drainage structures, using 1st class pipe, 4.017 mi. Taylor Co., to M. P. Smith Constr. Co., Yosemite, $37,350—24 and 30 ft. span rein.-con. bridge and creek gravel surfacing 0.549 mi. Allen and Simpson Counties, to E. Hardy & Son, Pulaski, Tenn., $14,611. Grand total $155,685. Noted Oct. 9.

Kentucky—State Hy. Dpt., Frankfort, traffic bound limestone surfacing 6.017 mi. Beaver Dam-Rockport Rd., State Project 45-CS, Ohio Co., to Corum Bros., Madisonville, $37,775. Noted July 31.

Louisiana—State Hy. Comn., Baton Rouge, gravel surfacing 9.1 mi. Winnsboro-St. Joseph Hy., Tensas Parish, to Nelson Bros., Columbian Mutual Trades Bldg., Memphis, Tenn., $83,917. Noted Oct. 9.

Louisiana—State Hy. Comn., Baton Rouge, constructing reef shell road on 5.1 mi. hy., Ascension and Livingston Parishes, to Globe Constr. Co., Louisiana Bldg., New Orleans, $35,065; grading, clam shell surfacing 5 mi. hy., Vermillion Parish, to I. M. Goldberg, Abbeville, $27,940. Noted Oct. 9.

Louisiana — State Hy. Comn., Baton Rouge, grading, local material surfacing 4 mi. roads in Rapides Parish, to T. L. James & Co., Ruston, $27,811—5 mi. Union Parish, to R. C. Webb, Delta, $29,722 — gravel surfacing 8.9 mi. Catahoula and Lasalle Parishes, to Robinson Constr. Co., Centerville, Miss., $60,497—2.8 mi. St. Landry and Evangeline Parishes, to Shuptrine Constr. Co., Eupora, Miss., $32,789—8 mi. DeSoto Parish, to S. B. Boyd, Columbia, Miss., $62,782—broken stone surfacing 7.3 mi. Jackson Parish, to Harvey & Jones, Jonesboro, $64,963. Grand total $278,564. Noted Oct. 9.

La., New Orleans—City Council, 6 in. concrete curbing, Uvalde asphalt wearing surface paving 6,310 sq.yd. Project 101, Burdette St., to Southern Uvalde Rock Asphalt Co., New Orleans Bank Bldg., $35,360 — concrete curbing, Warrenite bitulithic wearing surface on 6 in. concrete paving 8,890 sq.yd. Thalia St., to Craven & Lang, New Orleans Bank Bldg., $47,240 — sub-surface drainage system, manholes, handholes, cleanouts 5,855 ft. Desire St., 26 and 29 ft., and 5,030 ft. Laharpe St., 29 ft., to H. P. and J. F. Egan, New Orleans, $32,850 and $25,060 respectively. Grand total $140,510.

Mass., Attleboro—Dpt. P. Wks., City Hall, penetration bituminous macadam paving North Main St., day labor. $85,000.

Mass., Boston—Dpt. P. Wks., bithulithic paving Audubon Rd., Ward 21, to C. W. Callahan, 23 South Fairview St., Roslindale. Est. $25,000. Noted Oct. 23.

Mass., Brookline (br. Boston) — Bituminous macadam paving Hammond St., to Simpson Bros. Corp., 77 Summer St., Boston. Est. $25,000.

Michigan — H. C. Fleming, Grand Rapids, resident engr., grading, shaping, surfacing 1.333 mi. MO34-10-C-2, Ionia Co., 20 ft., to State Constr., Lansing, $50,000.

Michigan — G. H. Greene, resident engr., Alpena, grading, shaping, drainage, one course gravel surfacing 2.771 mi. MO60-5, Contr. 2, Montgomery Co., 16 ft., to C. G. Bridges, Escanaba, for State Hy. Comn., Lansing, $32,552. Noted Oct. 9.

Michigan—L. N. Jones, resident engr., Crystal Falls, grading, shaping, drainage, concrete paving 7.852 mi. FO 52-19, Contr. 2, Marquette Co., 20 ft., to Thornton Bros. Co., Hancock, for State Hy. Comn., Lansing, $335,457, incl. cement. Noted Oct. 9.

Michigan—Village Clerks Office, Durand, grading, shaping, drainage, concrete paving 4.664 mi. FO25-24 Contr. 1, Genesee Co., and 36.57 mi. FO76-23 Contr. 1 Shiawassee Co., both 20 ft., to Goldberg Constr. Co., Petoskey, for State Hy. Comn., Lansing, $124,988 and $114,920 respectively, both incl. cement. Noted Oct. 9.

Mo., Clayton—St. Louis Co., Court House, grading, concrete paving ¼ mi. Jennings Station Rd., 20 ft., to J. Steuby, 473 South Van Buren St., Kirkwood, $7,723. Noted Oct. 16.

Mo., Clayton—St. Louis Co., Court House, concrete paving 1,900 ft. Lockwood Ave., Webster Groves, to C. M. Berry Constr. Co., 2732 Sutton Ave., Maplewood, $14,764—1,317 ft. North and South Rds. in Brentwood, to Ansbor & Maguire, Title Guarantee Bldg., St. Louis, $21,014—9,135 ft. Tesson Ferry Rd., to Flinn Paving Co., 1405 South 1st St., St. Louis, $55,671. Grand total $92,349. Noted Oct. 23.

N. J., Fair Lawn — Bd. Boro Council, Boro Hall, grading, concrete paving Plaza Rd., to Sost Contg. Co., Nutley, $38,734.

N. J., Trenton — West Windsor Twp. Com., cement paving Princeton-Junction-Cranbury Rd., to Yeo Constr. Co., Chestnut Hill, Pa., $27,123.

N. J., Union — Township Comn., Municipal Bldg., grading, 7 in. single line rein.-con. paving Crawford Terrace, to Watchung Constr. Co., 318 Richmond St., Plainfield, $19,480. Noted Oct. 20 Daily.

N. Y., Brooklyn—H. Hesterberg, pres. Brooklyn Boro, Boro Hall, to L. B. Harrison, 189 Montague St., granite block paving Nassau Ave., $32,833; to Lenze & Hesse Contg. Co., 9th St., $12,771—to Castle Bros., Johnson Pl., grading Knapp St., $9,529—to R. Lynster, 454 East 49th St., Troy Ave., $2,475—to W. J. McHale, 1250 Jefferson Ave., West 6th St., $2,386—to M. A. Zapponi, 15th Ave., $1,586 — to B. Turecamo, New Cropsey Lane, asphalt paving Albany Ave., $10,112; East 42nd St., $5,719; East 43rd St., $7,760; Van Sicien St., $15,961; West 5th St., $7,931—to Brooklyn Alcatraz Asphalt Co., 407 Hamilton Ave., Bay 10th St., $8,137; Dahlgren Pl., $15,699; Farragut Rd., $15,812; Tilden Ave., $12,821 — to M. J. O'Hara, Neptune Ave. and West 19th St., East 27th St., $3,476; East 27th St., $6,275 — to Uvalde Asphalt Paving Co., Metropolitan Ave., Livonia Ave., $24,777. Grand total $196,060. Noted Oct. 16.

N. Y., Long Island City—G. U. Harvey, pres. Queens Boro, Queens Subway Bldg., asphalt paving Fresh Meadow Rd., to Meehan Paving & Constr. Co., Laurel Hill Blvd., $20,608—Queens Ave., to Borough Asphalt Co., 1301 Metropolitan Ave., Brooklyn, $21,248 — 95th Ave., to Kennedy & Smith, Bradford Ave., Flushing, $4,818—103rd St., to Cleveland Trinidad Paving Co., Flushing, $17,450—regulating 84th and 126th Sts., to Brugel Contg. Co., 1154 Cypress Ave., Ridgewood, $6,807 and $5,175 respectively—Hamilton Pl., to Peace Bros., Inc., 57 North Lawrence St., Flushing, $4,550. Grand total $80,656. Noted Oct. 16.

N. Y., New York—A. Goldman, comr. Plant & Structures, Municipal Bldg., New York, paving under Greenpoint Avenue Bridge, Queens and Brooklyn Boros, to Collins Constr. Co., 135 New York Ave., Brooklyn, $24,428. Noted Oct. 23.

N. Y., New York—J. Miller, pres. Manhattan Boro, Municipal Bldg., asphalt paving Maiden Lane, to Meehan Paving Constr. Co., 90 West St., $6,757. Noted Oct. 16.

N. Y., New York—H. Bruckner, pres. Bronx Boro, Crotona Park, 3rd and Tremont Aves., to P. Mascali, curbing Hering Ave., $3,858; Lacombe Ave., $1,026; regulating Newman Ave., $3,803; Halpern Ave., $1,953; White Plains Rd., $3,862—to F. Mascali & Sons, Inc., 645 East Tremont Ave., Magenta St., $8,907—to F. Del Balso & Sons, Inc., 1933 West Farms Rd., Odell St., $1,835—to Remo Eng. Corp., 645 East Tremont Ave., Seymour Ave., $3,461—to F. Gabriel, 2750 Creston Ave., Zulette Ave., $10,402. Grand total $39,107.

O., Cincinnati—Hamilton Co., grading sidewalks, curbing, concrete repaving 9,500 sq.yd., to Brewer & Brewer Sons 906 Main St., $27,506. Est. $41,014. Noted Oct. 16.

O., Columbus—W. H. Duffy, dir. Serv., grading, curbing, drainage, laying water and sewer connections, asphalt paving 5,100 ft. Beaumont Rd., from High St. to Indiana Ave., 26 ft., to Cleveland Trinidad Paving Co., 55 East Gay St., $54,561 est. $81,467; grading, curbing, draining, asphalt paving 1,214 ft. Glenn Ave. from 3rd to 5th Sts., 32 ft., to B. F. Patterson, 996 West Goodale St., $10,718.

O., Garfield Heights (br. Cleveland)—Village, sandstone curbing, 3 in. brick paving, to N. Siegel, Western Reserve Bldg., Cleveland, $43,057.

O., Lisbon—Columbiana Co., grading Hanover-Mechanicstown Rd. south from public square in Hanover to New Kensington-Summittville Rd., to F. Cox, Kensington, $25,030. Est. $25,000.

O., Salem—For 2 in. asphalt resurfacing East State St. from North Linden St. to old corporation line and asphalt on macadam paving Superior St. from 8th St. to North Lincoln Ave., to Kelley & Meyer Co., 1509 Market St., Youngstown, $34,155. Est. $35,000.

Oklahoma—State Hy. Dpt., Oklahoma City, asphalt top surfacing 1.24 mi. State Aid Project 763, Murray Co., 20 ft., to Western Paving Co., Petroleum Bldg., Oklahoma City, $24,202. Est. $25,000.

Okla., Oklahoma City — J. W. Berry, clk. Oklahoma Co., Court House, paving 10 mi. East G. Ave. Rd., 18 ft., to Western Paving Co., Petroleum Bldg., $124,298. Est. $170,000. Noted Nov. 6.

Oregon—State Hy. Comn., Salem, improving Old Oregon Trail, Umatilla Co., to C. R. Sietz, La Grande, $26,085 — Wapineta Hy., Wasco and Clackamas Counties, to Fisher Bros., Oregon City, $30,048—Oregon Washington Hy., Umatilla Co., to Knute Lied, La Grande, $30,220—9.27 mi. McKenzie Hy., Lane Co., to Saxon & Looney, Jefferson, $79,440—Crater Lake Hy., Jackson Co., to Morrison Trucking Co., 391 East 6th St., Portland, $122,179—north unit, Roosevelt Coast Hy., Lincoln Co., to W. Endicott, Martras, $98,363—and south unit same hy., to C. R. Johnson, Portland, $96,077. Grand total $482,412.

Pennsylvania—State Hy. Dpt., Harrisburg, grading, concrete surfacing 10,187 sq.yd. Route 70, Springdale and East Deer Twps., Allegheny Co., to A. G. Rothy, Elizabeth, $171,613; grading, bituminous treated waterbound macadam surfacing 12,154 sq.yd. Oxford Twp., Adams Co., to L. M. Hutchison, Orbisonia, $32,440. Noted Oct. 1.

Pa., Phila.—Bureau Hys., Dpt. P. Wks., City Hall Annex, A. Murdock, dir., to Montgomery Paving Co., Harrison Bldg., asphalt paving (assessment work) Bingham St. from Unruh to Kerper Sts., $3,768; Cheltenham St. from Summerdale to Frontenac Sts., $5,011; Comly St. from Bingham to Tabor Sts., $7,648; Hollerman St. from Rising Sun to Palmetto Sts., $2,594; Lawndale St. from Comly to Bonner Sts., $5,522; Levick St. from Palmetto to Rising Sun Sts., $3,437; Palmetto St. from Robbins to Levick Sts. $4,594; Robbins St. from Rising Sun to Lawndale Sts. $9,831—to Eastern Paving Co., Penna Bldg., Glenwood St. from Palethorpe to Mascher Sts. and Venango St. from Mascher to Front Sts., $8,396—to Union Paving Co., Broad and Stiles Sts., asphalt repaving Schoolhouse Lane and Market Square Rd., $4,867; redressed granite block repaving 12th St. from Cambridge to Glenwood Sts. and shoulders on same from Glenwood to Sedgley Sts., $15,470—to F. R. Curtis, State Rd. and Unruh St., country road improving Tabor St. from Levick St. to Martins Hill Rd., $1,749. Grand total $72,887. Noted Oct. 23.

Pa., Phila.—Bureau Hys., Dpt. P. Wks., City Hall Annex, A. Murdock, dir. to Union Paving Co., Broad and Stiles Sts., asphalt paving (assessment work) Allen St. from Orthodox to Wilmot Sts. $4,274; C St. from Ashdale to Sheldon Sts. $3,468; Jannette St. from Gerhard to Monastery Sts. and Maria St. from Jannette to Henry Sts. $6,279; Longshore St. from Roosevelt Blvd. to Brous Sts. $8,829; Pratt St. from Marlow to Charles Sts. $3,486; country road improving Laycock St. from 80th St. to Island Ave., $1,981; Mermaid St. from Germantown to Garfield Sts. $2,281; Spring Lane from Tripple to Ridge Sts. $7,073, asphalt repaving Ritner St. from 5th to 6th Sts. $4,676—to Eastern Eng. Co., Penna Bldg., furnishing, delivering ready mixed concrete $370. Grand total $42,717.

Pa., Pittsburgh — R. G. Woodside, controller Allegheny Co., grading, rein.-con. paving 18,834 ft. Flaugherty Run Rd., 18 ft., to M. Mannella, Oliver Bldg., $240,708. Noted Oct. 23.

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Streets and Roads (Continued)

South Carolina—State Hy. Dpt., Columbia, to R. G. Lassiter & Co., Columbia, paving 9 mi. Lancaster and Chester Counties, $139,189; 6 mi. Cherokee Co., $95,549; 10 mi. Orangeburg and Clarendon Counties, $175,037; 5 mi. Laurens Co., $72,631; 7 mi. Allendale Co. $120,381—to Noll Constr. Co., Charlotte, N. C., 16 mi. Oconee Co., $292,995—to Cornell-Young Co., Macon, Ga., 9.5 mi. Edgefield Co., $127,987—to Dickson-Carroll Co., Greenville, 2.1 mi. York Co., $34,288—to B. H. Martin, Fountain Inn, 21.6 mi. Lexington and Orangeburg Counties, $286,044 — to Carolina Contg. Co., Columbia, 0.276 mi. Richland Co., $10,315—to W. C. Carson, Batesburg, grading 19.2 mi. Beaufort and Jasper Counties, $80,838 — to Hendricks & Kennedy, Charlotte, N. C., 5.2 mi. Union Co., $17,518 — to W. C. Sheppard, Atlanta, Ga., top soiling 6.3 mi. Pickens Co., $53,115—to Hooper Constr. Co., Bunnell, Fla., sand clay surfacing 12.4 mi. Jasper Co., $123,848 — to E. Pettus, Montgomery, Ala., constructing 4 rein.-con. bridges Colleton Co., and 3 rein.-con. bridges, Colleton and Hampton Counties, $30,310 and $32,233 respectively—to Atlantic Bridge Co., Greensboro, rein.-con. bridge Greenwood-Laurens Counties, $88,652—to J. S. Bowers, Whiteville, N. C., rein.-con. bridge, Horry and Marion Counties, $135,389—to L. Riddle, Asheville, N. C., rein.-con. bridge, Cherokee Co., $10,399—to Palmer Constr. Co., Florence, rein.-con., treated timber, structural steel bridge, Colleton Co., $7,530—to Kiker & Yount, Reidsville, N. C., 6 rein.-con. bridges, Dorchester Co., $76,888 — to A. V. Hooks, Charlotte, N. C., substructure rein.-con. bridge, Newberry and Union Counties, $49,162 — to Roanoke Iron & Bridge Wks., Roanoke, Va., superstructure for same bridge, $7,685. Grand total $2,067,983. Noted Sept. 25.

Tex., Houston—Harris Co., asphalt on concrete paving 11.3 mi. South Houston-La Porte Rd., 20 ft., to Gulf Bitulithic Co., 2820 Polk Ave. $380,433. Est. $400,000.

Utah—State Rd. Comn., Salt Lake City, grading, surfacing 5.305 mi. Midland Trail, Utah Co., to Morrison-Knudson Co., Boise, Idaho, $150,000. Est. $172,613.

Wash., Seattle—King Co., grading 1 mi. Maple Valley-Black Diamond Rd., to N. Fiorito, 844 West 48th St., $26,819. Noted Sept. 18.

B. C., Douglas—Dpt. P. Wks., Victoria, clearing, grading 7 mi. new road from Douglas at Peace Arch to Ladner Trunk Rd., 40 ft., $300,000. Work may be done by day labor under unemployment scheme. P. Philip, Dpt. P. Wks., Victoria, engr.

B. C., Vancouver — Dpt. P. Wks., Victoria, clearing, grading 26 acres lands for streets in University Heights sub-division, day labor, $100,000. P. Philip, Victoria, engr.

Ontario — Dpt. P. Hys., Parliament Bldgs., Toronto, grading, culverts 6.5 mi. Peterboro Rd. easterly, to Brennan Paving Co. Ltd., 400 Gage Ave. N., Hamilton—6.5 mi. Arthur Rd. Easterly, to Benstedt Bros., Box 157, Milverton—1.5 mi. Greenwood Diversion, to J. K. Stout Haulage Co., 5 Southview Ave., Toronto—3 mi. L'Original Diversion, to McAlpine & Belanger, L'Original—4 mi. Paris Rd. easterly, to Armstrong Bros., Main St., Brampton—grading 12 mi. Gananoque-Seeleys Bay Rd., to V. H. Woodland, R.R. 2, Cardinal—4 mi. Brooklin westerly, to J. Pearson, Stevensonville, est. $200,000. Noted Oct. 9.

Ont., Hamilton—City Council, City Hall, widening 1 mi. Main St. $78,000, Beckett Dr. $40,000, day labor under supervision W. A. McFaul, city engr.

Ont., New Toronto—Town asphalt and concrete paving 7th St. from Lake Shore Rd. to New Toronto St., to R. V. Huffman Constr. Co., 331 Bay St., Toronto. Est. $27,000.

Ont., Toronto — Toronto and York Rds. Comn., 570 Adelaide St. E., grading, culverts 1¼ mi. Wilson Ave., to A. E. Jupp Constr. Co. Ltd., 170 Berkeley St., Contr. 13-30; 5 mi. Don Mills Rd., Contr. 14-30, to Richardson Constr. Co. Ltd., 10 Adelaide St. E. Est. $50,000.

Ont., Toronto—Asphalt on concrete paving Fleet St. Sect. A, and Sherbourne St., $62,186, day labor—concrete paving 2 lanes to P. Delgreco, 60 Montcalm Ave., $6,287—bitulithic on concrete paving Cuthbert Crescent, to Warren Bituminous Paving Co., 74 University Ave., $8,367. Grand total $76,840.

Ont., Toronto — B. S. Wemp, mayor, City Hall, asphalt paving Bathurst St., to Rayner Constr. Co. Ltd., 159 Bay St., $27,585 — Bathurst St., to McNamara Constr. Co. Ltd., 53 Yonge St., $26,986—concrete and brick block paving 2 lanes, L. P. Acri, 28 Grove Ave., $2,037. Grand total $56,608. Noted Oct. 2.

Ont., Whitby—Town, bitulithic paving 0.75 mi., to A. E. Jupp Constr. Co., 170 Berkeley St., Toronto. Est. $25,000.

EXCAVATION, DRAINAGE, IRRIGATION, LEVEES, RIVER AND HARBOR

PROPOSED WORK

Calif., Los Angeles — Los Angeles Co. straightening lower channel San Gabriel River at its outlet into Alimitos Bay, $600,000 or more. E. C. Eaton, Los Angeles, co. flood control engr.

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Calif., Santa Monica—Santa Monica Harbor Co. Ltd., 2,000 ft. breakwater, 18 ft. wide at top, 30 ft. wide at base, 30 ft. in water depth, using rein.-con. honey-combed boxes 100 ft. in length. T. Ashton, Rives-Strong Bldg., Los Angeles, engr.

Ia., Sioux City — Woodbury Co., probably takes bids this fall Reynolds Creek Drainage Ditch, incl. 180,000 cu.yd. excav., near Danbury, and Weber Creek Drainage Project, 50,000 cu.yd. excav., near Harnick. J. M. McLean, co. engr. E. L. Ferguson, Sioux City, consult. engr.

Mass., Barnstable—E. L. Thayer, Barnstable, sea walls and fill solid in 2 sections, Centerville River. $15,000 or more.

Mass., Harwich—J. R. Storing, timber bulkhead, pier, fill solid in Herring River. $25,000. Private plans.

Okla., Maysville — Garvin Co., c/o J. T. Blanton, organizing drainage district. $35,000.

Tex., Harlingen—Farm & Home Savings & Loan Assn., Nevada, near here, acquired 10,000 acre Afams tract, near here, and plans developing same into first-class irrigation system, incl. net-work concrete canals. $1,000,000. Private plans.

BIDS ASKED

Conn., Hartford—Dec. 9, by Bd. Contr. & Supply, equipment for South Meadows Storm Water Pumping Station. R. N. Clark, city engr.; adv. E. N.-R. Nov. 13. Noted Oct. 9.

La., Opelousas — Nov. 26, by Bd. Comrs. Prairie Basse Gravity D. D. 15, St. Landry Parish, 35 mi. drainage canals, incl. 700,000 cu.yd. earth excav. M. J. Goudeau, Opelousas, engr.

Mass., Quincy—Nov. 18, by Dpt. P. Wks., Boston, A. W. Dean, engr., dredging channel and basin at Houghs Neck, 30,000 cu.yd. scow or 27,000 cu.yd. place measurement.

CONTRACTS AWARDED

Calif., Modesto—Bd. Directors Modesto Irrigation Dist., to Pacific Constr. Co., 2235 East 7th St., Oakland, 131,500 sq.ft. 2½ in. concrete canal lining and 5,600 sq.ft. 2 in. canal lining $9,522, 50 cu.yd. concrete in walls and floor of main canal tunnel $1,250, raising concrete sidewalks in Upper Canal incl. 940 cu.ft. concrete $857. Grand total $11,629. Noted Oct. 23.

Ia., Muscatine—Muscatine Co., cleaning out Drainage Sub-Dist. 1 of Drainage Dist. 2, incl. 10,300 ft. ditch or 5,207 cu.yd. excav., to R. J. Phelps, Iowa City, $1,020. Noted Oct. 9.

La., Shreveport — Caddo Levee Dist., Caddo Co., levee at Eagle Bend, Red River, incl. 145,000 cu.yd. excav. and levee at Shreves Island, Red River, right bank, 107,000 cu.yd. excav., to New Constr. Co., Echo, at $0.152 per cu.yd. Noted July 17.

Miss., Biloxi—For 7,000 ft. concrete sea wall along Beach Blvd. to Steward & Lewis, New Orleans, La. Est. $3,500,000.

Miss., Clarksdale — Coahoma Drainage Dist., Coahoma Co., Lateral O., drainage canal, 6,000 ft. long, 21,800 cu.yd. excav., to Midland Constr. Co., Clarksdale, at $0.10 per cu.yd.

N. Y., New York—M. Cosgrove, comr. Docks, Pier "A," Battery Pl., dredging between East 100th and East 120th Sts., Harlem River, Contr. 1993, to H. N. DuBois Sons Co., 17 State St., $7,610. Noted Oct. 23.

Tex., Edinburg — Hidalgo Co. Water Impvt. Dist. 6, A. L. Cramer, pres., irrigation system, incl. 400,000 sq.ft. concrete canal lining, to Rio Grande Eng. Co., San Benito; gunite work, to National Gunite Contg. Co., 82 West Dedham St., Boston, Mass.; 36,100 ft. 12- to 30-in. underground pipe, 18 manholes, 44 meters, 31 vents, 3 pumps, 3 pump houses, etc., to R. W. Briggs & Co., Pharr, $124,911. Noted Oct. 9.

Public Bond Elections

Coming Bond Elections

Waterworks Impvts.—Heavenor, Okla., $75,000.
Waterworks Impvts. — Twin Falls, Idaho, $90,000.
Sewerage System — Maysville, Okla., Nov. 12, $25,000.
Bridge, etc.—Vicksburg, Miss., $50,000.
Bay Front Beautification—Corpus Christi, Tex., $1,650,000.
Light Plant—Cushing, Okla., Dec. 2, $300,000.

Bonds Voted

Waterworks—Fresno, Calif., $2,500,000.
Waterworks Distribution System — Hayward, Calif., $150,000.
Waterworks—Patten Twp., Pa., $50,000. T. B. Ferguson, Secy., Turtle Creek.
Waterworks Impvts.—Midvale, Utah, $125,000.
Waterworks—Woodville, Tex., J. Rady, Waco, Engr., $30,000.
Sewers—Winchester, Ky., $180,000.
Sewer and Paving — East Cleveland, O., M. Garnett, City Hall, Engr., $67,000.
Sewers, Storm and Sanitary—Cleveland, O., R. Hoffman, Engr., $5,000,000.
Sewage Disposal Plants—(Ten year program.) Cleveland, O., $14,000,000.
Bridge—San Francisco, Golden Gate Bridge and Hy. Dist., J. D. Strauss, Ch. Engr., $35,000,000.
Bridges, Street Extensions, Completing Ogden Ave., Street Lighting, Traffic Signals, Playgrounds, Lincoln Park Extension — Chicago, Ill., $19,360,000.
Bridge, Grade Elimination, Paving—Baltimore, Md., $2,000,000.
Bridge, Roads, Public Markets and State Capitol Building—State Louisiana, $87,000,000.
Harbor Impvts.—Baltimore, Md., $10,000,000.
Harbor Development, Piers, Railroad Extension, etc.—State California, F. C. White, Ch. Engr., San Francisco Harbor Comn., $10,000,000.
Airport—Baltimore, Md., $2,500,000.
Airport—Omaha, Neb., $500,000.
Straightening Cuyahoga River, Landings, Bulkheads, etc.—Cleveland, O., $3,250,000.
Grade Elimination, Highways and Water Supply Sites—New Jersey, $100,000,000.
Park Improvements—Cleveland, O., $500,000.
Street Widening, Opening New Streets—Cleveland, O., $2,500,000.
Hydro Electric Plant — Mt. Pleasant, Mich., $40,000.
Auditorium—Lexington, Ky., $300,000.
Fair Ground Buildings — Tulsa County, Okla., $60,000.
Hospitals and Prisons, — State New York, $50,000,000.
Jail—San Francisco, Calif., $850,000.
Surgery Unit, etc. — Fresno County, Calif., Swartz and Ryland, Archts., $250,000.
School Addition—Osborn, O., $180,000.
State Institutions—Montana, $3,000,000.

Bonds Defeated

Waterworks—Wilmette, Ill., $700,000.
Water Softening Plant—Troy, O., $90,000.
Sewers—Los Angeles, Calif., $6,000,000.
Bridge Repairs—Dayton, O., $100,000.
Bridge—Lorain Co., O., $2,000,000.
Airport—San Francisco, City and County, Calif., $4,000,000.
Waterfront Impvts.—Portland, Ore., $1,250,000.
Incinerator—San Francisco, Calif., $1,000,000.
Power Development, etc.—Los Angeles, Calif., $13,300,000.
Light and Power Plant Repairs — Tippecanoe City, O., $100,000.
School, City Hall, etc.—Albany, Calif., $162,000.
Hospital—Madera County, Calif., $150,000.
County-City Building — San Diego, Calif., $1,000,000.

FEDERAL GOVERNMENT

PROPOSED WORK

Calif., San Diego—GYMNASIUM, etc.—Spec. 6275—Yards & Docks, Navy Dpt., gymnasium and welfare buildings.

Calif., San Diego—SHOP—Yards & Docks, Navy Dpt., metal aircraft structures shop.

D. C., Wash.—RIP RAP—U. S. Eng. Office, furnishing, placing 15,000 tons rip rap seawall foundations in Anacostia River.

Ind., Decatur—POST OFFICE—Treas. Dpt. at office Superv. Archt., post office.

Mass., Boston—AIR COMPRESSORS—Spec. 6280 — Yards & Docks, Navy Dpt., air compressors.

N. Y., Mineola — QUARTERS — Con. Q.M., Mitchel Field, cancelled bids to have been opened Dec. 2, 13 double sets non-commissioned officers quarters. Revising plans. Noted Oct. 30.

Tex., Galveston — IMMIGRATION STATION —Treas. Dpt. at office Sup. Archt., preliminary surveys immigration station and detention building. $250,000.

BIDS ASKED

California—BREAKWATER—Dec. 3, by U. S. Eng., 751 South Figueroa St., Los Angeles, repairing 3,000 lin.ft. outer section breakwater in Long Beach Harbor. Noted Oct. 2.

California — ROAD — Nov. 25, by C. H. Sweetser, dist. engr. Pub. Rds., 461 Market St., San Francisco, grading, placing selected material on 10.86 mi. Sects. A and B, Route 73, Laguna Natl. Forest Hy., Cleveland Natl. Forest, San Diego Co.

Calif., San Francisco—ENGINE—Nov. 28, by Quartermaster Supply Officer, General Depot, Fort Mason, combined steam and hand driven, 5 x 5½ Hyde or equal engine, Schedule 928-31-120.

Calif., Sacramento—LEVEE—Nov. 19, by U. S. Eng., California Fruit Bldg., raising existing levee along west side Yolo By-Pass at Sullivan, Sullivan and Roche lands, involving 157,000 cu.yd.

Conn., New London—ACADEMY, etc.—Dec. 5, by Treas. Dpt. at office Superv. Archt., academy buildings, stadium equipment, appurtenances, outside services, at U. S. Coast Guard Academy. Noted Aug. 21.

Ill., Bloomington—POST OFFICE—Dec. 4, by Treas. Dpt. at office Sup. Archt., post office (except elevator).

Ill., Rock Island — BARGES — Nov. 25, by U. S. Eng., ten 5 x 24 x 110 ft. steel material barges; adv. E. N.-R. Nov. 13. Noted Nov. 6.

Ia., Knoxville — INFIRMARY — Dec. 9, by U. S. Vet. Bu., Arlington Bldg., 1 N.P. Infirmary, incl. roads, walks, grading, at U. S. Veterans Hospital.

Louisiana—BRIDGE—Dec. 3, by U. S. Eng. Office, New Orleans Dist., constructing railway swing bridge across site of Louisiana-Texas Intracoastal Waterway on Bayou Sales branch of Texas and New Orleans R.R. Co., near North Bend; also constructing, maintaining, removing 2,000 ft. detour track, installing bridge track, and raising approach tracks; adv. E. N.-R. Nov. 13.

Federal Government (Continued)

Mass., Athol—VESTIBULES—Treas. Dpt. at office Sup. Archt., taking bids entrance vestibules, U. S. Post Office.

Minn., Fort Snelling—EXCAVATING—Nov. 18, by U. S. Eng., St. Paul, realigning channel, 330,000 cu.yd. excav. in Mississippi River above here.

Missouri—PILING DIKES—Dec. 3, by U. S. Eng., 428 Custom House, St. Louis, 10,000 ft. piling dikes in Missouri River at Bonhomme Bend.

Mo., Dover—DIKES—Nov. 26, by U. S. Eng., 707 Postal Telegraph Bldg., Kansas City, 8,180 lin.ft. standard pile clump dikes, 1,640 lin.ft. standard crib dikes, 10,000 lin.ft. standard revetment in Missouri River at Sheeps Nose and Berlin Bends, 2.9 mi. from here. Noted Oct. 23.

Mo., Kansas City—DIKES—Nov. 28, by U. S. Eng., 707 Postal Telegraph Bldg., 16,405 lin.ft. standard pile clump dikes; 5,950 lin.ft. standard revetment in Missouri River at Camden and Sni Bends, Lexington Reach, about 3.9 mi. from Wellington. Noted Nov. 6.

N. C., Fort Bragg—QUARTERS—Dec. 10, at office Constr. Q. M., constructing, completing nurses quarters; adv. E. N.-R. Nov. 13.

Pa., Pittsburgh—MANEUVER BOATS—Dec. 10, by U. S. Eng., furnishing, delivering 3 steel maneuver boats; adv. E. N.-R. Nov. 13. Noted Oct. 30.

S. C., Spartansburg—ELEVATOR—Nov. 25, by Treas. Dpt. at office Supervising Archt., 1 passenger elevator in U. S. Post Office and Court House.

Tex., Randolph Field—GARAGE—Nov. 26, by Con. Q.M., post garage. Noted Nov. 6.

Va., Portsmouth—EXTENSION, etc.—Dec. 2, by Treas. Dpt. at office Superv. Archt., extending, remodeling (except elevator) U. S. Post Office.

Wash., Puget Sound—STOREHOUSE—Nov. 20, by Yards & Docks, paint and oil storehouse building, at Navy Yard.

Wash., Seattle—BOILER PLANT—Spec. 6207—Dec. 3, by Yards & Docks, Navy Dpt., boiler plant building.

Wyo., Casper—ELEVATOR—Dec. 1, by Treas. Dpt. at office Superv. Archt., installing 1 passenger elevator at U. S. Post Office, Court House.

Canal Zone—RESERVOIRS, etc.—Nov. 29, by Con. Q. M., Quarry Heights, excavating for three 1¼ m.g. concrete water reservoirs; constructing Reservoir 2, on Engineers Hill, Corozal, installing 16 in. c.i. main from existing main at Corozal to proposed reservoir; 16 and 20 in. manifold at proposed reservoir to point at Corundo River at Sta. 96 plus 10, incl. valves, fittings.

CONTRACTS AWARDED

Calif., San Diego—OIL ROAD—Spec. 6289—Yards & Docks, Navy Dpt., oil road to shell house at Naval Air Station, to R. H. Downer, 3435 33rd St., $1,977 (45 days).

Idaho—CANAL—U. S. Reclamation Serv., Denver, Colo., 3.5 mi. extension Shoshone Canal between Little and Big Wood Rivers, American Falls Reservoir Dist. 2 near Gooding, to Morrison & Knudson, Boise, $208,969. Noted Oct. 2.

Ky., Louisville—FOUNDATIONS—Treas. Dpt. at office Sup. Archt., foundations U. S. Post Office to Henry Bickel Co., Inc., 435 Garden St., $68,305. Noted Oct. 23.

Mass., Amesbury — RETAINING WALL — Treas. Dpt. at office Sup. Archt., repairing retaining wall, to E. A. and P. B. Currier, 7 Sanborn Terrace, $2,792. Noted Oct. 2.

Mass., Boston—COMPRESSOR—Treas. Dpt. at office Sup. Archt., watercooled compressor for elevator equipment at Appraisers Stores, to Otis Elevator Co., Wash., D. C., $4,400.

Minn., Hastings—DREDGING—U. S. Eng., St. Paul, 125,000 cu.yd. in Mississippi River bottoms, to LaCrosse Dredging Co., 405 Plymouth Bldg., Minneapolis, at $0.22 per cu.yd. Noted Oct. 23.

Neb., Lincoln — STORE HOUSE — Vet. Bu., Arlington Bldg., store house for U. S. Veteran's Hospital, to Olson Constr. Co., 704 Stuart Bldg., $27,716. Noted Oct. 9.

N. M., Albuquerque — EXTENSION — Treas. Dpt. at office Sup. Archt., extending, remodeling U. S. Post Office and Court House, to N. P. Severin Co., 222 West Adams St., Chicago, Ill., $503,000 (550 days); elevator plant, to Otis Elevator Co., 810 18th St., Wash., D. C., $37,774. Noted Sept. 25.

O., La Carne—HOSPITAL—Con. Q. M., post hospital, to B. Pelton, 510 Osborn St., Sandusky, $61,950. Noted Oct. 9.

O., Toledo—COURT HOUSE—Treas. Dpt. at office Sup. Archt., constructing U. S. Post Office, Court and Custom House, to N. P. Severin Co., 222 West Adams St., Chicago, Ill., $713,550. Noted Sept. 18.

Texas — RADIO BEACONS, etc. — Dpt. Commerce, c/o Aeronautics Branch, 80 radio marker beacons and 10 sets spare parts, to C. B. Speaker & Co., Inc., Star Bldg., Wash., D. C., $59,951; 250 airway 18 in. course lights, to Westinghouse Electric & Mfg. Co., 150 Bway., New York, $14,437; fencing 6 fields between Fort Worth and Wink, to S. D. Morris, El Paso, $6,849; grading, reconditioning fields, to Clark & Estes, Monahans, $18,173. Grand total $99,410.

Tex., Randolph Field — POST EXCHANGE, etc. — Con. Q.M. post exchange and service station, to R. E. McKee, 1916 Texas St., El Paso, $41,700. Noted Oct. 2.

Tex., Randolph Field — QUARTERS — Con. Q.M., bachelor officers quarters, to Murch Bros. Constr. Co., Railway Exch. Bldg., St. Louis, Mo., $351,950. Noted Oct. 2.

Va., Quantico—BARRACKS—Spec. 6230—Yards & Docks, Navy Dpt., barracks, distributing system, roads at Marine Barracks, to R. Sollitt Sons Constr. Co., 228 North LaSalle St., Chicago, Ill., $1,243,074. Noted Oct. 30.

Wash., Keyport—AUTOMATIC TELEPHONE—Spec. 6302—Yards & Docks, Navy Dpt., automatic telephone at Pacific Coast Torpedo Station, to Automatic Electric Co., Inc., 1033 West Van Buren St., Chicago, Ill., $9,179 (120 days).

Wis., Ashland — DREDGING — U. S. Eng., Duluth, Minn., in Ashland Harbor, to Duluth-Superior Dredging Co., foot 45th Ave. W., Duluth, Minn., $60,614.

Utah — ROAD — Pub. Rds., Ogden, grading 8.351 mi. Widtsoe-Bryce Canyon Natl. Forest Rd., Garfield Co., to I. Bundy, Ogden, $32,171. Est. $46,099. Noted Oct. 30.

FEDERAL POWER COMMISSION

Applications for License and Permits

Licenses

1124—Metropolitan Water Dist. of Southern California, 222 South Hill St., Angeles, Calif., wants preliminary permit power project affecting public land and land within Chemehuevi Valley, Indian Reservation on Colorado River in San Bernardino Co. Calif. and Yuma and Mojave Counties, Ariz.

1125—Quinault Hotel Co., Inc., Quinault, Wash., wants license constructed power project on Gatton Creek within Olympic Natl. Forest, in Grays Harbor Co.

1126—Odell Lake Co., Inc., Crescent Lake, Ore., wants license power project on Odell Creek within Deschutes Natl. Forest, Klamath Co.

1127—North Virginia Power Co., Winchester, Va., wants license transmission line partly within Shenandoah Natl. Forest, Frederick Co., Va. and Hardy Co. W. Va.

RAILWAYS

BIDS ASKED

Ontario—See "Contracts Awarded."

CONTRACTS AWARDED

Texas—Atchison, Topeka & Santa Fe R.R., G. W. Harris, ch. engr. system Chicago, Ill., 8¼ mi. standard gage line from Heaton, (8 mi. east of Pampa), in southwesterly direction, to serve carbon black companies, Lefors oil fields, to Sharp & Fellows, 533 Central Bldg., Los Angeles, Calif., $70,000.

Ontario — Canadian Pacific Ry., J. M. R. Fairbairn, ch. engr., H. O. Windsor Sta., Montreal, Que., placing 15 mi. rock ballast, west of Chaplean, day labor and own forces. $75,000.

SUBWAYS AND TUNNELS

PROPOSED WORK

O., Cleveland—City, rein.-con., steel passageway for Lakefront Stadium. To exceed $50,000. G. B. Sowers, City Hall, engr.

Ont., Woodstock—City and Canadian National Ry., C. S. Gzowski, ch. engr. constr., Montreal, Que., concrete, steel subway under tracks at Ingersoll Rd. $30,000. W. J. Ure, city engr.

New York—Nov. 21, by Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, installing tracks and contract rail for part Rapid Transit R.R. on Route 107, Sects. 11 and 12, and part Sect. 13, Route 108, Sect. 1 and part Sect. 2, Manhattan, Brooklyn and Queens Boros.

N. Y., Brooklyn — Nov. 25, by Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, constructing Sect. 8, Route 107, part of subsurface railroad extending under and along Lafayette Ave. from South Oxford St. to Bedford Ave. Former bids rejected. Noted Sept. 11.

N. Y., Long Island City — Nov. 21, by Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, constructing Sect. 9, Route 108, subsurface railroad along and under Queens Blvd., private property, and 137th St. from Union Turnpike to Hillside Ave., Queens Boro.

CONTRACTS AWARDED

N. Y., Long Island City—Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., New York, constructing Sect. 6, Route 108, Rapid Transit R.R. along and under Queens Blvd. from 55th Ave. to 64th Rd., to G. H. Flinn Corp., 9 East 41st St., New York, $5,328,921. Noted Oct. 9.

N. Y., New York—Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., to Bethlehem Steel Co., 25 Bway., special work, Order 54 $44,970, open hearth track rail, Order 14 $481,770, spikes, Order 14 $56,636; to Republic Steel Corp., 60 East 42nd St., plates, Order 14 $115,080 bolts, nuts, washers, Order 14 $32,022; to Rail Joint Co., 165 Bway., joint bars, Order 14 $69,271. Grand total $799,749. Noted Oct. 16.

GRADE CROSSINGS

PROPOSED WORK

N. J., Kearny (br. Newark)—Erie R.R. Co., G. S. Fanning, eli. engr., 50 Church St., New York, eliminating 3 grade crossings on Belleville Turnpike. $450,000. Private plans.

N. Y., Albany—Delaware & Hudson R.R. Co., J. MacMartin, ch. engr., new grade crossing on South Pearl St. $120,000.

N. Y., Brushton — Rutland R.R. Co., P. E. Crowley, pres., 466 Lexington Ave., New York, eliminating Bell Crossing on Moira State Hy., near here. $85,000.

N. Y., Cohoes—New York Central R.R. Co., F. B. Freeman, ch. engr., 466 Lexington Ave., New York, eliminating grade crossing Vliet St. $120,000.

N. Y., York—Delaware, Lackawanna & Western R.R. Co., G. J. Ray, ch. engr., Hoboken, N. J., reconstructing railroad bridge to carry tracks over Pavilion-Greigsville County Hy., Livingston Co.

O., Cleveland—New York Central R.R., R. O. Route, ch. engr. (lines west of Buffalo, N. Y.), subway type grade elimination, West 130th St. and Puritas Rd.

BIDS ASKED

N. Y., Mount Pleasant — Nov. 26, by Westchester Co. Park Comn., J. Downer, ch. engr., Bronxville, overcrossing at Bway., Hawthorne, 2 river bridges, grading in Bronx Parkway Extension, here. J. Downer, ch. engr.; adv. E. N.-R. Nov. 13.

Ohio—Nov. 18, by R. N. Waid, dir. Hys., Columbus, constructing concrete overhead crossing for New York Central Lines, incl. drainage structures, concrete paving 0.483 mi. Sect. D, Springfield-Urbana Rd., Clark Co., $63,351; constructing subway under Hocking Valley tracks, brick paving Sect. Canal, Winchester, Columbus-Winchester Rd., Franklin Co., $62,751; constructing subway under New York Central R.R. tracks, macadam paving 0.208 mi. Sect. E-1, Columbus-Lancaster Rd., same co., $43,949; constructing subway under New York Central R.R. and Toledo, Angola & Western R.R. tracks, brick paving 0.17 mi., Sect. 1-Subway, Toledo-Angola Rd., Lucas Co., $22,500; constructing subway under Baltimore & Ohio R.R., concrete paving 1.935 mi. roadway, constructing 1 concrete girder bridge, 1 culvert, repairing bridge, Sect. G, Columbus-Washington C. H. Rd., Madison Co., $153,559.

Utah—Nov. 17, by State Rd. Comn., Salt Lake City, 1.5 mi. concrete overpass, incl. earth fill and graveling approaches. $40,000. H. S. Kerr, Salt Lake City, engr.

CONTRACTS AWARDED

Pa., Bristol—Pennsylvania R.R., T. J. Skillman, ch. engr., Broad St. Sta., Phila., grade elimination, to H. F. Curtis, 1270 Bway., New York. Est. $226,000.

DAMS

PROPOSED WORK

Ill., Springfield—Bd. P. Wks., City Hall, W. J. Spaulding, comr., concrete, earth dam to form reservoir and pleasure lake, dredging, constructing additional water-mains. $5,000,000. **Maturity 1931.** Burns, McDonnell Eng. Co., 402 Interstate Bldg., Kansas City, Mo., and Pearse, Greeley & Hanson, 6 North Michigan Ave., Chicago, Ill., engrs.

CONTRACTS AWARDED

Tex., Dallas—Dallas Power & Light Co., terurban Bldg., 8,600 ft. earthen dam, 225 ft wide at base, 16 ft. wide at crown, creating lake covering 3,500 acre Mountain Creek bottom land, incl. 700,000 cu.yd. fill, 20,000 cu.yd. cement for spillway, Mountain Creek, near here, to W. E. Callahan Constr. Co., Kirby Bldg., $1,500,000. Contract awarded Oct. 30, work started. Noted June 5 under "Power Plants."

PIERS AND WHARVES

PROPOSED WORK

N. J., Bradley Beach — PIER — Bd. Boro Comrs., Boro Hall, preliminary plans fishing pier, timber, concrete, on ocean front. $25,000.

N. J., Ocean City—PIER—Anglers Fishing Club, timber, concrete pier, on ocean front. $25,000.

BIDS ASKED

Quebec — WHARF — Nov. 20, by N. Desjardins, secy. Dpt. P. Wks., Ottawa, Ont., wharf extension at Father Point, Rimouski Co. $45,000.

B. C., Kaslo—WHARF—Nov. 21, by N. Desjardins, secy. Dpt. P. Wks., Parliament Bldgs., Ottawa, Ont., pile bent and creosoted timber superstructure wharf, Kootenay Dist. $20,000.

CONTRACTS AWARDED

Ont., Port Maitland—WHARF—Dpt. P. Wks., Parliament Bldgs., Ottawa, reconstructing wharf, to Ontario Constr. Co., Toronto, $9,804.

AIRPORTS

PROPOSED WORK

Mass., East Boston (sta. Boston)—City of Boston, Park Dpt., 33 Beacon St., soon takes bids 40 x 280 ft., concrete seaplane ramp, J. J. Murphy, Park Dpt., 33 Beacon St., Boston, engr. $25,000.

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Airports (Continued)

Tex., Port Arthur—City, surveys municipal airport, docks, barge slip, on and near route of Intracoastal Canal. Noted Feb. 6.

Ont., Hamilton — City, expending $40,000-$50,000 for airport, incl. grading, drainage, runways, beacons, etc. W. L. McFaul, City Hall, engr.

BIDS ASKED

Mo., Bridgeton—Dec. 9, by Bd. P. Serv., 208 City Hall, 1 story, 90 x 120 ft., brick, steel, concrete hangar and lean-to at St. Louis Airport, for use of U. S. Naval Reserves. $45,000. L. R. Bowen, engr. and A. Osburg, archt., both 301 City Hall, St. Louis. Nov 6.

POWER AND LIGHTING

PROPOSED WORK

Ont., Rockliffe—Federal Dist. Comn., Ottawa Electric Bldg., Ottawa, installing lighting system, incl. wiring, poles, fixtures. $30,000. D. Blair, Ottawa Electric Bldg., Ottawa, engr.

BIDS ASKED

Minn., Minneapolis—Nov. 21, by F. S. Gram, city purch. agt., 18 mi. No. 10, copper-clad, 40% conductivity, cable and fixtures, for police signal system.

CONTRACTS AWARDED

Ark., Hot Springs—See "Waterworks."

Kan., Kansas City — Bd. P. Utilities, C. A. Lowder, secy., steel tower, equipment, to Line Material Co., South Milwaukee, Wis., $7,952; oil circuit breakers, to General Electric Co., 510 Dwight Bldg., $11,698; regulators and miscellaneous parts, to Westinghouse Electric & Mfg. Co., 2124 Wyandotte St., Kansas City, Mo., $14,937 and $1,294 respectively; transformers, to Moloney Electric Co., 5390 Kingshighway-Bircher St., St. Louis, Mo., $11,130. Grand total $47,011.

N. Y., Brooklyn—J. J. Dorman, fire comr., Municipal Bldg., New York, underground fire alarm system, Williamsburg Impvt., to M. C. Seelig, 3962 10th Ave., New York, $20,882. Noted Oct. 23.

N. Y., Syracuse—New York Telephone Co., South State St., 4 mi. underground conduit in Brighton Ave. and Brighton Rd., to Street Bros., 921 East Hiawatha Blvd., $60,000.

Ont. Oshawa—City and Canadian Natl. Rys., T. T. Irving, ch. engr. New Union Sta., Toronto, subway, 18 ft. deep., 60 ft. wide under tracks at Simcoe St., to Bathe & McLellan, 17 Yonge St. Est. $250,000. Noted Oct. 9.

SPORTS AND PARKS

PROPOSED WORK

Ill., Champaign—Holabird & Root, archts, 333 North Michigan Ave., Chicago, soon takes bids 1 story, 196 x 208 ft., ice skating rink, reinforced concrete roof trusses, for University of Illinois Athletic Assn., G. Huff, dir., Gymnasium Bldg. $200,000. Noted June 20, 1929.

Mass., Dorchester (sta. Boston) — City of Boston, Park Dpt., locker and bath, at Savin Hill Beach. $40,000.

Mass., Hyannis — Hyannisport Club, L. F. Paine, pres., Masonic Bldg., reconstructing golf course, developing 40 additional acres. $25,000 or more. D. J. Ross, South Shore, Little Compton, R. I. engr.

N. J., Palisades Park—Bd. Educ., Municipal Bldg., municipal athletic field, west of Erie R.R. tracks between Central and Blvd. and Roosevelt Pl. $25,000 or more. Project in abeyance. Noted July 17.

N. Y., Albany—City bids probably in March, municipal golf course. Engineer not selected.

BIDS ASKED

Mass., Brookline—See "Contracts Awarded."

Mass., Dorchester (sta. Boston)—Nov. 18, by Dpt. P. Wks., Boston, furnishing, placing 3,000 cu.yd. sand or gravel on Coulter's Beach, Savin Hill Bay, for Commonwealth of Massachusetts, A. W. Dean, Dpt. P. Wks., Boston, engr.

Mass., Holliston—See "Contracts Awarded."

Mass., South Boston (sta. Boston)—Nov. 21, by Park Dpt., 33 Beacon St., Boston, grading, sanding beach, at Columbus Park. $30,000.

N. J., Newark—Bd. Educ., City Hall, bids about Nov. 15, improving West Side High School Playground, grading, sodding, running track, handball and tennis courts at South Orange Ave. $60,000. Former bids rejected. C. F. Bertrand, Federal Trust Bldg., engr. Noted Aug. 14.

O., Cleveland—Nov. 20, by City, furnishing 88,000 seating capacity for Lakefront stadium.

CONTRACTS AWARDED

Ill., Decatur—City, Park Bd., O. W. Smith, mayor, 1 story, 70 x 140 ft. and 50 x 120 ft., brick, stone pavilion, to A. Krall, 1977 Wood St., $55,000.

Mass., Brockton — Y.M.H.A. and Y.W.H.A. Community Centre, L. Hellman, Brockton, 3 story, 110 x 120 ft., brick, steel gymnasium, incl. swimming pool, to T. F. Crowell & Sons, 19 South St. Est. $150,000. Noted Oct. 30.

Mass., Brookline—Town, Park Dpt., municipal golf course at Putterham Playground, day labor. To exceed $25,000.

Mass., Holliston — E. A. Hilton, Holliston, miniature golf course, dance hall at Braggville

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Sect., on State Rd., separate contracts. Est. exceeds $25,000. Private plans.

Mich., Detroit—City, Dpt. Parks & Boulevards, 735 Randolph St., constructing lower cascade for James Scott Memorial Fountain, on Belle Isle, involving marble work, installation mechanical equipment, piping, etc., to Bryant & Detwiler Co., 2806 Union Trust Bldg., $53,829.

O., Oberlin—Oberlin College, E. H. Wilkens, pres., 1 story, 50 x 112 ft., brick, steel, concrete swimming pool for girls, to Crowell & Little Constr. Co., Hanna Bldg., Cleveland. Est. $150,000. Noted Oct. 30.

UNCLASSIFIED

PROPOSED WORK

Calif., Fresno — GAS PIPE LINE — San Joaquin Light & Power Corp., Power Bldg., natural gas pipe line from Kettleman Hills to Fresno. $700,000. **Maturity soon.** Private plans.

Calif., San Francisco — SHED — California State Harbor Comn., Ferry Bldg., rein.-con., steel shed at Pier 15. $200,000. F. G. White, Ferry Bldg., engr.

Colorado—GAS PIPE LINE—Colorado Interstate Gas Co., c/o F. J. Trelaese, Colorado Springs, soon lets contract 40 mi. 8 or 10 in. gas pipe line, steel from Devine to Portland. $500,000. Ford, Bacon & Davis, 39 Bway., New York, engrs.

Minn., Minneapolis — ASPHALT PLANT — City, c/o N. W. Elsberg, city engr., asphalt plant, 26th St., $55,000. Work will probably be done by day labor.

R. I., Newport — BUS TERMINAL — Shore Line Bus Co., W. H. Vanderbilt, pres., soon takes bids 1 story, brick, steel, Spring St. $50,000. E. M. Corbett, 167 Bedford St., Fall River, Mass., archt. Noted Oct. 9.

Tex., Huntsville—FISH HATCHERY—State Game, Fish and Oyster Comn., c/o W. J. Tucker, Huntsville, soon takes bids fish hatchery. $50,000.

Texas—GAS PIPE LINE—Utilities Fuel Supply Co., Dallas, and Victoria, granted franchise to run 10 in. c.i. welded gas pipe line through Victoria Co. almost parallel with Hy. 128, from Victoria in central Texas to connection with one of company's northwest Texas mains. Private plans.

Texas and **Nebraska**—NATURAL GAS PIPE LINE—Western Natural Gas Corp., 1101 Midland Bldg., Kansas City, Mo., natural gas pipe line from Texas Panhandle fields to Omaha, Neb. $4,000,000. Omaha voting Nov. 30 on proposition of changing system. Plans are slowly being worked out as to whether or not to convert artificial system as used now or into natural gas system in order to take gas from Western Natural Co.

BIDS ASKED

Idaho, Wallace—TUNNEL—See "Contracts Awarded."

New Jersey—FENDERS—Dec. 1, by State Hy. Comn., Trenton, fenders in Hackensack and Passaic Rivers, Route 25, Connecting Link, Sects. 3 and 6, Contr. 47, Hudson and Essex Counties. A. L. Grover, ch. clk.; adv. E. N.-R. Nov. 13.

N. J., Spring Lake—PAVILION—Dec. 1, by Mayor and Common Council, constructing new North End Pavilion. $25,000.

Texas — PIPE LINE — See "Contracts Awarded."

CONTRACTS AWARDED

Ariz., Tucson—CULVERT—City drainage culvert over Arroya, to J. J. Garfield Building Co., Tucson, $71,398.

Conn., Bloomfield — RADIO STATION — Doolittle Radio Corp., 5 Beecher Ave., New Haven, two 165 ft. steel towers, 1 story, 20 x 30 ft. frame station, radio transmitting equipment, to Allyn Wadhams Co., 15 Lewis St., Hartford. Noted Oct. 30.

Conn., Wethersfield — OIL TANK — Ballard Oil Co., 252 Asylum St., Hartford, steel fuel oil tank, 60,000 bbl. capacity. $25,000. Owner builds. Private plans.

Idaho, Wallace—TUNNEL—Jack Waite Mining Co., 500 ft. tunnel, reconstructing mill and 4 mi. railroad from mine to Junction of Eagle and tributary Creeks, day labor. $380,000. J. R. Turner, mgr. Noted Sept. 25.

Ind., Indianapolis—COAL CRUSHING PLANT—Link Belt Co., 230 South Belmont St., steel contract coal crushing plant, to Insley Mfg. Co., 801 North Olney St. Est. $25,000.

Ind., South Bend—FREIGHT TERMINAL—Chicago, South Shore & South Bend Ry. Co., freight terminal, incl. boiler, fire doors, plumbing, to C. H. Lorenz, Michigan City. Est. $30,000.

Mass., Chilmark — TOWER and SPIRE — Chilmark Methodist Episcopal Church, church tower, spire and changes, to F. R. Allen, Chilmark, est. $25,000.

Mass., Salem—LOCKER—Salem Gas Light Co., 209 Washington St., 1 story, brick, concrete storage locker, Pierce Ave., to E. H. Porter Constr. Co., 15 Wallis St., Peabody. Est. $25,000.

Mass., Taunton—COMFORT STATION—City, Building Dpt., City Hall, brick, steel, comfort station, to Babbitt & Simmons, 94 Weir St., $30,000. Noted Oct. 23.

O., Cleveland—ORE UNLOADING FACILITIES, etc.—Pennsylvania R.R., T. J. Skillman, ch. engr., Broad St. sta. Phila., Pa., ore unloading facilities and improvements, to Dock 11, to Wellman Eng. Co., Cleveland, O., and 30 Church St., New York. Est. $106,000.

Texas—PIPE LINE—Humble Oil & Refining Co., Humble Bldg., Houston, 110 mi. 10 in. c.i. welded pipe line between Van and Henderson. $2,000,000. Work starting, most of work to be done by company forces.

Tex., Beaumont—TANKS—Sun Oil Co., Beaumont, erecting 2 steel tanks, 83,000 bbl. oil capacity, to Petroleum Iron Wks., Beaumont, $62,000.

Tex., Galveston—GAS MAINS—Texas Cities Gas Co., Galveston and Texas City, 2½ mi. 6 in. high pressure natural gas mains in distributing system, mostly own forces. $45,000. Private plans.

Tex., San Antonio—MARKET HOUSE REFRIGERATING UNITS—City, c/o J. Rubiola, comr., 17 refrigerating units in market house, to E. Friedrich, East Commerce St., $17,382; other improvements, by own forces. Total est. $40,000. Noted Oct. 9.

Wis., Milwaukee—CAR BARN—Milwaukee Electric Ry. & Lighting Co., 217 Michigan St., 1 story, 60 x 340 ft., brick, steel car barn, Fiebrantz St., to Lupuiski, Inc., 101 East Capi-

Ont., Brantford—WAR MEMORIAL—Brant Co., granite war memorial on concrete found., to McIntosh Granite Co., Ltd., 1623 Yonge St., Toronto. $30,000.

MATERIALS

PROPOSED WORK

PORTLAND CEMENT—**Minneapolis, Minn.**—F. S. Gram, city purch. agt., bids probably in December, 125,000 bbl. portland cement for street work in 1931. N. W. Elsberg, city engr.

BIDS ASKED

GAS PIPE—**Coalinga, Calif.**—City, E. J. McCroskey, clk., taking bids 5,000 ft. 3 in. gas pipe.

STANDARDS—**San Francisco, Calif.**—Nov. 24, by L. S. Leavy, city purch. agt., 600 metal and 300 concrete standards for Boulevard System in various sections city.

LUMBER and PILING—**Cedar Rapids, Ia.**—Nov. 18, at office Auditor Linn Co., 194,200 board ft. untreated and 73,729 board ft. treated bridge lumber, 1,600 lin.ft. red cedar and 3,850 lin.ft. creosoted yellow pine piling.

LUMBER, POSTS, etc.—**Harlan, Ia.**—Nov. 19, at office Auditor Shelby Co., bridge lumber, piling, posts, corrugated culvert pipe, miscellaneous hardware, paint.

LUMBER—**Boston, Mass.**—Nov. 14, by Supply Dpt., pine and spruce lumber as specified, to Bridge Service, Dpt. P. Wks. $5,000 or more. F. A. Chapman, supt. Supply Dpt.

WATER PIPE—**Boston, Mass.**—Nov. 20, by Transit Dpt., 1 Beacon St., 48 in. welded steel water pipe and specials, as specified. To exceed $5,000.

PIPE—**Ocean City, N. J.**—Nov. 17, by Bd. City Comrs., City Hall, 15 and 18 in. vitr. clay pipe. $5,000. W. Collisson, Jr., city engr.

ASPHALTIC CEMENT—**Brooklyn, N. Y.**—Nov. 19, by H. Hesterberg, pres., Brooklyn Boro, Boro Hall, 150,000 gal. asphaltic cement, and bituminous concrete mixtures B; 3,000 cu.yd. asphalt sand; 1,000 net tons limestone or other suitable inorganic dust; 500 bbl. portland cement; 2,000 cu.yd. binder stone; 100,000 gal. fuel oil.

PLANES, AXLES, WHEELS, etc.—**Phila., Pa.**—Nov. 17, by C. E. Walsh, purch. agt. Pennsylvania R.R. Co., 15 North 32nd St., Contr. 20—1930, plates, bars and shapes; Contr. 30—1930, axles; Contr. 31 — 1930, steel wheels; Contr. 32—1930, steel pipe.

POLES—**Toronto, Ont.**—Nov. 17, by Hydro Electric Power Comn. of Ontario, W. W. Pope, secy., 190 University Ave., lot of 5,000, 10,000 or 15,000 red or jack pine poles, 25-50 ft. long for transmission line purposes. $100,000. F. A. Gaby, ch. engr.

CONTRACTS AWARDED

LEAD COVERED CABLE—**Los Angeles, Calif.**—City, lead covered cable under Spec. 2205, to General Cable Corp., 939 East 4th St., $66,933. Noted Oct. 23.

EQUIPMENT

PROPOSED WORK

MOTOR TRUCK—**El Segundo, Calif.**—City, V. D. McCarthy, city clk., purchasing two 1½ ton motor trucks with hand-hoists.

MOTOR GRADER—**Indio, Calif.**—City purchasing motor grader with scarifier attachment, also with cab and 10 ft. blade, weight not less than 12,800 lb.

TRACTOR—**Luverne, Minn.**—R. Koehn, and Rock Co. rejected bids Oct. 3, 1 crawler type tractor. Will probably readvertise. Noted Sept. 25.

FLUSHER—**Moorhead, Minn.**—City, R. G. Price, clk., bids probably in spring, motor-operated street flusher. C. H. Luckey, city engr.

BIDS ASKED

METAL WORKING LATHES—**Boston, Mass.**—Nov. 17, by City, Dpt. School Buildings, metal working lathes for Brighton High School.

Equipment (Continued)

TRACTOR—Minneapolis, Minn.—Nov. 21, by F. S. Gram, city purch. agt., one 10-20 tractor. N. W. Elsberg, city engr.

TRUCKS—Waseca, Minn.—Nov. 25, by H. A. Panzram, aud. Waseca Co., purchasing or renting trucks for snow plowing.

CONTRACTS AWARDED

BOILER EQUIPMENT—Boston, Mass.—Institutions Dpt., boiler equipment to replace pulverizers at Long Island Hospital, Long Island, Boston Harbor, to J. J. Hurley & Co., 104 Bway., $32,688. Noted Oct. 23.

PLOWS — Trenton, N. J. — State Hy. Dpt., fifty 50 ton snow plows, to Hiel Co., 26th and Montana Aves., Milwaukee, Wis., at $150 each, 75 plows, to Good Roads Mchy. Co., Commercial Trust Bldg., Phila., Pa. $128.89 each.

FOREIGN

Argentina — Firestone Tire & Rubber Co., South Main St., Akron, O., plans tire and tube manufacturing plant, in Buenos Ayres or other location.

U. S. S. R., Tadjikistan—Soviet Government, Moscow, irrigating desert lands near here. To exceed $5,000,000. Address inquiries to Amtorg Trading Corp., 261 5th Ave., New York, N. Y.

Buildings

BUILDINGS—RESIDENTIAL

BIDS ASKED

Mass., Brighton—(sta. Boston)—See "Contracts Awarded."

Mass., Brookline—See "Contracts Awarded."

Mass., Haverhill—Haverhill Trust Co., c/o C. V. Badger, archt., 50 Merrimac St., taking bids 4 story, basement, brick, stone, plain found., Summer St. $150,000.

N. J., Lakewood — Lakewood Milk & Rest Cure, Inc., 154 Nassau St., New York, bids about Dec. 15, general contract 2 story, basement, brick, steel hotel and sanitarium, $300,000. H. Ginsberg, 205 East 42nd St., New York, archt. Noted Oct. 9.

N. Y., Forest Hills—See "Contracts Awarded."

N. Y., Long Island City — See "Contracts Awarded."

N. Y., New York—See "Contracts Awarded."

N. Y., New York—A. M. Bing & Son Realty Co., A. M. Bing, pres., 18 East 48th St., taking bids on separate contracts 11 story, 80 x 107 ft., 412 East 52nd St. $400,000. E. Roth, 1440 Bway, archt.

N. Y., St. Albans (br. Jamaica)—See "Contracts Awarded."

O., Cleveland—Nov. 15, by A. C. Dudley, 2460 Fairmount Blvd., 3 story, basement, 100 x 105 ft., brick, tile, East 146th St. and Milverton Ave. $200,000. A. E. Keller, 2570 Overlook Rd., archt.

O., Dayton — W. R. Herby, archt., U. B. Bldg., taking separate bids 6 story, basement, 75 x 130 ft., brick, steel, rein.-con., Bedford stone hotel, plain found., 4th and Perry Sts., for Perry Hotel Co. $500,000.

Wis., Milwaukee—B. Uthus, archt., 208 3rd St., taking bids general contract 4 story, basement, 80 x 142 ft., brick, steel, Wisconsin St., for A. G. Wolff, 114 Wisconsin Ave.

CONTRACTS AWARDED

Mass Brighton (sta. Boston)—Construction & Realty Corp., M. Tasler, 333 Washington St., Boston, 3 story, basement, irregular sized, brick, steel, concrete found., Strathmore Rd., separate contracts. $150,000. Winebaum & Wexler, 73 Cornhill, Boston, archts.

Mass., Brookline—Aspinwall Constr. Co., c/o Silverman & Brown, archts., 51 Cornhill, Boston, 3 story, 120 x 140 ft., brick, steel, plain found., 156-160 St. Paul St., separate contracts. To exceed $150,000. Former contracts rescinded. Noted Oct. 23, under "Contracts Awarded."

N. J., Ventnor (br. Atlantic City)—McIlvain & Co., Inc., 112 South 16th St., Phila., Pa., general contract 6 story, basement, 40 x 75 ft., brick, steel, Marston Pl. and Cambridge Ave., to M. S. Bowen, 8605 Atlantic Ave., Margate City. Est. $150,000. Contractor taking bids on separate contracts.

N. Y., Forest Hills — Rodman & English, Hollis, apartment, 63rd Ave. and Burton St., separate contracts. $160,000. Private plans.

N. Y., Long Island City — Fillmore Garden Corp., 253 Montgomery St., Brooklyn, 6 story, 68 x 223 ft., 84th St. and Seward Ave., separate contracts. $270,000. Cohn Bros., 363 Stone Ave., Brooklyn, archt.

N. Y., Long Island City—Roth Alliance, Inc., 59-37 Queens Blvd., 6 story, 100 x 168 ft. apartments, Queens Blvd. and 59th Pl., separate contracts. $250,000. M. Hirsch, c/o owner, archt.

N. Y., Long Island City—Society of Phipps Homes, 787 5th Ave., New York, 6 story, 260 x 460 ft., 39th Ave., Fitting and 150th Sts., to Garden Estates, 18 East 48th St., New York. Est. $1,200,000.

N. Y., New York—C. Ciampi Realty & Building Co., 501 East Tremont Ave., 6 story, 95 x 135 ft. apartments, 201st St. and Marion Ave., day labor and separate contracts. To exceed $150,000. C. D. Clark, 441 East Tremont Ave., archt.

N. Y., New York—Crugbrad Constr. Corp., I. Prussin, pres., 349 East 149th St., 6 story, 84 x 200 ft., Cruger and Brady Sts., separate contracts. $225,000. Becker & Levy, 349 East 149th St., archts.

N. Y., New York—Hotel New Yorker Corp., Hotel New Yorker, 8th Ave. and 34th St., altering Hotel New Yorker, 8th Ave. and 34th St., to Smith & Kuhn, c/o owner. Est. $150,000.

N. Y., New York—Johnson Plaza Corp., 331 Madison Ave., 6 story, 83 x 135 ft. apartments, Johnson Ave. and Oxford St., separate contracts. $300,000. W. C. Sommerfield, 31 Union Sq., archt.

N. Y., New York—Schifter Realty Corp., 275 East Burnside Ave., 5 story, 75 x 100 ft. apartment, 233rd St. and Carpenter Ave., separate contracts. $150,000. I. L. Cransman, 275 East Burnside Ave., archt.

N. Y., New York—Two Thousand Two Hundred Eighty Andrews Avenue Realty Corp., M. S. Greenberg, pres., 2333 Grand Concourse, 6 story, 83 x 138 ft., Andrews Ave. and 183rd St., separate contracts. $225,000. I. L. Cransman, 275 East Burnside Ave., archt.

N. Y., New York—Vienna Morena, 864 East 225th St., apartments, Oakland Pl. and Crotona Ave., separate contracts. $150,000. J. Ziccardi, 912 Burke Ave., archt.

N. Y., St. Albans (br. Jamaica) — House Building & Holding Corp., 89-31 161st St., Jamaica, 2 story, Wisina Rd. and Irwin St., separate contracts. $150,000. A. E. Allen, 163-18 Jamaica Ave., Jamaica, archt.

N. Y., St. Albans (br. Jamaica) — I. Inganger & Son, owners and archts., Hollis, apartments, 217th St. and Foch Blvd., separate contracts. $150,000.

N. Y., St. Albans (br. Jamaica) — West Albans Homes, 111th St., Richmond Hill, 2 story, Selover Rd. and West 180th St., separate contracts. $350,000. A. E. Allen, 163-18 Jamaica Ave., Jamaica, archt.

Pa., Phila.—Owner, c/o Thalheimer & Weitz, archts., 10 South 18th St., 6 story, basement, 108,000 sq.ft. floor space, rein.-con., brick, steel, Wynnefield St., to Bee Bee Eng. Co., 13th and Nedro Sts.

R. I., Cranston (mail Providence)—A. J. Romano, 78 Main St., East Greenwich, 4 story, basement, brick, plain found., Broad St. and Wheeler Ave., to J. A. Meyer, 163 Rochambeau Ave., Providence. Est. $250,000.

Wash., Seattle—Pacific Homes, Inc., c/o E. W. Morrison, archt., Lloyd Bldg., 7 story, 60 x 120 ft. apartment hotel, 1618 9th Ave., to H. U. Taylor, 6526 31st St. N. E. Est. $150,000.

CLUBS

PROPOSED WORK

Mass., Brockton — National Club Building Comn., E. Perrault, chm., 7 Foss St., rejected bids 2½ story, basement, brick, stucco, plain found., Center and Hunt Sts. $150,000. C. T. Olson, 21 High St., archt. Will probably refigure. Noted Oct. 23.

N. J., Newark—Italian Catholic Club, c/o J. Centanni archt., 142 Market St., sketches 3 story, basement, brick, steel, Summer Ave. $150,000.

N. J., Jersey City—Polish-American Social Club, S. Osiecki, pres., 176 Pavonia Ave., 3 story, basement, brick, steel clubhouse. $150,000.

N. Y., New York—Railroad Y. M. C. A., National Bureau Y. M. C. A., 347 Madison Ave., bids after Nov. 10, general contract club, 220 East 47th St. $2,000,000. Warren & Wetmore, 16 East 47th St., archts. Noted Oct 16.

O., Cleveland — Abeyton Realty Corp., T. Gallico, supt. constr., 1649 Lee Rd., club house, golf course, Forest Hill Estate. $750,000. Maturity in spring. A. J. Thomas, 2 West 46th St., New York, archt.

BIDS ASKED

N. J., Weehawken—W. Mahnken, archt., 401 32nd St., Union City, bids about Dec. 15, general contract 3 story, basement, brick, steel club house addition, Boulevard E and 6th St., for B.P.O.E., 26th St. Est. $150,000. F. J. Ruker, 685 Hudson Ave., West New York, asso. archt. Noted Oct. 30.

CONTRACTS AWARDED

Conn., New Haven—Y. M. C. A., c/o D. Orr, archt., 956 Chapel St., brick, steel addition, incl. administration, gymnasium, classrooms, to Larkin Carey Co., 166 Brewery St. Est. $250,000. Noted Oct. 16.

La., New Orleans — Favrot & Livaudais, archts., Hibernia Bldg., 84 x 137 ft., rein.-con., brick, steel, terra cotta, granite, stucco, to G. F. Favrot, Balter Bldg., for Y. M. C. A. $259,447. Noted June 5.

Mich., Detroit—Smith, Hinchmann & Grylls, archts., 800 Marquette Bldg., general contract 3 story, basement, brick, steel, concrete, stone club house, plain found., to A. A. Albrecht, Penobscot Bldg., for University Club of Michigan, c/o architects. Est. $250,000. Noted Oct. 9.

O., Hamilton—Y. W. C. A., 3rd and Dayton Sts., 3 story, basement, brick, steel, concrete club, to Antenen Eng. Co., East and Hanover Sts. Est. $300,000. Noted July 10.

Tex., Fort Worth—Masonic Order, c/o W. S. Cook, Fort Worth Natl. Bank Bldg., excavation work for 4 story, basement, 120 x 167 ft., rein.-con., white stone masonic temple, Henderson, Lake, Texas and North Sts., to W. H. Southwell, Inc., 605 East 2nd St., $250,000. Noted Aug. 7.

HOSPITALS

PROPOSED WORK

Conn., Hartford — Cedar Crest Sanatorium, W. M. Stockwell, supt., Cedar Mt., Newington, new infirmary building. $200,000. Architect not selected.

Conn., Stamford—Stamford Hall Sanitorium, Summer St., plans by Fletcher-Thompson, Inc., 1336 Fairfield Ave., Bridgeport, 4 story, 45 x 200 ft. sanitorium unit. $150,000 or more.

Ill., Decatur—Sisters of St. Francis, Webster St., 2 or 3 story, brick addition, Wood St. $300,000. Architect not selected. **Maturity in spring.**

Ill., Normal—Brokaw Hospital Assn., R. O. Ahlemus, pres. of Board, 3 story, basement maternity ward, 3 story basement nurse home, 2 story basement isolated hospital, Franklin St. $225,000. Architect not selected.

Kan., El Dorado—Susan B. Allen Memorial Hospital Assn., L. D. Hadley, secy., soon takes bids 3 story, basement, 43 x 132 ft., concrete, brick hospital. $150,000. Washburn & Stookey, 222½ South Main St., Ottawa, archts. Noted Oct. 30.

Kan., Lawrence—University of Kansas, c/o Bd. Administration, H. R. Rhodes, bus. mgr., Topeka, sketches by J. W. Rodotinsky, state archt., State House, Topeka, hospital, probably rein.-con., brick, stone. $150,000-$200,000.

Mass., Arlington—Owner, c/o Kendall, Taylor & Co., archts., 142 Berkley St., Boston, sketches brick hospital addition, Summer St. $150,000 or more.

Mass., Brookline—Trumbull Hospital, R. A. Baxter, pres., 68 Allerton Rd., revised plans by H. L. Meacham, 120 Front St., Worcester, 4 story, basement, brick, steel hospital addition, plain found. $150,000. Noted Mar. 27.

Mass., Pittsfield—House of Mercy Hospital, C. B. Peck, supt., plans by Harding & Seaver, 7 North St., ward addition, North St. $150,000.

Mo., St. Louis—City, c/o Bd. P. Serv., 208 City Hall, bids in spring 6 story, 99 x 244 ft., rein.-con., brick, stone nurses home, Grattan and Carroll Sts. $600,000. A. P. Bowen, City Hall, engr. A. Osburg, City Hall, archt. Noted July 10.

N. H., Durham—University of New Hampshire, E. M. Lewis, pres., sketches by E. T. Huddleston, Durham, brick, fireproof, infirmary, dairy, rest house. $150,000.

N. Y., Albany—Livingston Manor Co. plans by C. H. Gardinier, 75 State St., 2 story, basement, 28 x 100 ft., brick, steel hospital, plain found., Livingston Manor.

N. Y., Balston Spa—Saratoga Co., new building at Homestead Sanitarium, in Providence. $200,000.

Tex., Edinburg — City, c/o D. C. Abney, mayor, soon lets contract remodeling 5 story, brick, rein.-con. hospital, incl. new roofing. $150,000.

BIDS ASKED

N. J., Browns Mills—F. Grad, archt., 1023 Broad St., Newark, bids about Dec. 15, general contract Deborah Sanitarium, 4 story, basement, brick, steel, for Deborah Jewish Relief Society, M. M. Unger, chn. in charge, 763 Broad St., Newark. $600,000. Noted Oct. 2.

Pa., Pittsburgh — Nov. 18, by J. F. McWilliams, archt., 6200 Penn Ave., 5 story, basement, sub-basement, 104 x 135 ft., U shaped, brick, steel nurses' home, Frankstown Ave., for Pittsburgh Hospital, D. McCahill, chn. Financial Com., Frick Bldg. Noted Oct. 9.

CONTRACTS AWARDED

Ind., South Bend—Bd. Comrs. Saint Joseph Co., general contract brick, rein.-con. hospital, Niles Rd., to J. Nelson Co., South Bend. Est. $150,000.

Mass., Boston—Boston Dispensary, A. G. Rotch, 25 Bennett St., altering and constructing 4 story, basement brick, stone dispensary addition, plain found., to Canter Constr. Co., 6 Beacon St. $150,000, cost plus fixed fee.

Mass., Boston—Boston Floating Hospital, E. Dope, chm., 244 Washington St., 4 story, basement, brick, steel, plain found., to Canter Constr. Co., 6 Beacon St., at cost plus fixed fee. $150,000 or more. Noted Oct. 25.

Mass., Boston—New England Medical Center, J. A. Cousen, pres., Tufts College, Tufts Teaching Clinic, Nurses Home and Laboratory, 5 story, basement, brick, steel, plain found., to Canter Constr. Co., 6 Beacon St., cost plus fixed fee. Est. exceeds $150,000. Noted Oct. 30.

Mass., Palmer — Commonwealth of Massachusetts, Dpt. Mental Diseases, State House, Boston, brick nurses home, brick, steel reception hospital, to M. Solimando, 27 School St., Boston, $49,800 and $58,280 respectively. Noted Oct. 23.

O., Cincinnati — Hamilton Co. Tuberculosis Comn., 2 story, basement, rein.-con. hospital dining hall, plain found., Guerley Rd., to Penker Constr. Co., Summer St., $120,150.

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Hospitals (Continued)

Tex., New Braunfels—Southland Nature Cure Sanatorium Inc., R. C. Reynolds, doctor, 1 and 2 story, stucco, hollow tile, rein.-con. sanatorium, to W. Sippel, New Braunfels. $150,000, cost plus percentage basis. Noted Sept. 11.

Que., Montreal — Notre Dame Hospital, 44 x 262 ft. hospital addition, to E. G. M. Cape Co. Ltd., 960 New Birks Bldg., $789,000. Noted Mar. 27.

CHURCHES

PROPOSED WORK

Calif., Carmel — Carmelite Sisters, Carmelite by the Sea, plans by Maginnis & Walsh, Statler Bldg., Boston, Mass., rein.-con. monastery. $250,000-$300,000.

Calif., Los Angeles — Roman Catholic Archbishop Church, Shelby Ave., plans by Newton & Murray, Architects Bldg., rein.-con., Shelby Ave. $500,000.

Conn., Middletown — St. Sebastian Roman Catholic Church, A. Santolini, pastor, 930 Dixwell Ave., New Haven, sketches by R. C. Gorrani, 175 Green St., Worcester, Mass., 1 story, brick, Washington St. $150,000.

Ill., Clinton — Methodist Episcopal Church Congregation, A. Boyd, pastor, plans by Royer-Danely-Smith, Flat Iron Bldg., Urbana, 2 story, brick, Washington St. $150,000. **Maturity in April.**

Mass., Boston—St. Brendan's Roman Catholic Church, T. W. Twohig, pastor, plans by E. T. P. Graham, 171 Newbury St., 1 story, basement, stone, granite, Southern Artery between Granite and Neponset Aves. $150,000 or more. Noted May 15.

Mass., Springfield — St. Barnabas Episcopal Church, J. H. Nolan, pastor, plans by C. C. Coveney, 164 Beylston St., Boston, brick, stone, Summer Ave. $150,000.

N. H., Portsmouth—Immaculate Conception Parish, J. H. Brennan, pastor, 98 Summer St., church. $150,000 or more funds being raised for same. Architect not selected.

N. J., Athenia—St. Joseph's Roman Catholic Church, L. Szoc, pastor, 5 Parker Ave., Passaic, plans by M. L. Walker, 131 East 47th St., New York, 2 story, basement, brick, steel church, school, Speer Ave. $150,000. Noted Oct. 9.

N. J., New Brunswick — Christ Episcopal Church, W. H. Stone, pastor, 216 Lawrence St., sketches 2 story, basement, brick, steel rectory, on 65 x 150 ft. site, College Ave. between Richardson and Huntington Sts. $150,000.

N. Y., Cohoes — St. Rita's Church, M. A. Galanti, pastor, bids in spring, church, Lancaster St. $250,000. Architect not selected.

N. Y., New York—L'Eglise St. Jean Baptiste, 184 East 76th St., plans by R. J. Reiley, 12 East 41st St., 5 story, 25 x 53 ft. dormitory, and 5 story, 25 x 53 ft. brother's house, 194-96 East 76th St. $160,000.

O., Cleveland—Kinsman Jewish Center, c/o D. Weiss, 12402 Kinsman Rd., plans by S. Braverman, Ulmer Bldg., 2 story, brick, steel, concrete, synagogue, social center, East 147th St. and Kinsman Rd. $150,000.

Pa., Pittsburgh—New Advent Lutheran Congregation, J. E. Slater, pastor, Marie St., Wilkinsburg, sketches church, Sunrise St. $150,000. Architect not selected.

Ont., Ottawa — Roman Catholic Parish Canadian Martyrs, E. Killian, pastor, plans by W. C. Beattie, Ottawa, church, Lee Ave.

BIDS ASKED

Mass., Leominster—Nov. 15, by St. Leo's Roman Catholic Parish, M. G. Slattery, 108 Main St., brick, stone convent, Main St. $150,000. J. W. Donohue, 1200 Main St., Springfield, archt. Noted Nov. 6.

N. J., South River—A. Merchant, archt., 1 Elm Row, New Brunswick, bids about Jan. 15, general contract 1 and 2 story, basement, tower, brick, stone, Main and Gordon Sts., for Methodist Church. $150,000.

CONTRACTS AWARDED

Calif., Carmel — Carmelite Monastery, Santa Clara, 1 and 2 story rein.-con. buildings, to T. M. Jones, 643 29th Ave., San Francisco, $500,000. Noted Nov. 13.

Okla., Oklahoma City—First Baptist Church, Robinson St., 3 story, 76 x 144 ft., brick, plain found., Robinson St., to Campbell & Price, 6054 West Main St., $150,000.

Pa., Pittsburgh — Ingham & Boyd, archts., 1211 Empire Bldg., 2 story, basement, 70 x 97 ft., stone, hollow tile church, incl. auditorium, Sunday school room, organ room, kitchen and session room, for All Saints Episcopal Congregation, C. S. Shoemaker, chn. building com., 1432 Termon Ave., N. S. Pittsburgh, to Rose & Fisher, A. Laub, in charge, Martin Bldg., N. S. Pittsburgh; plumbing, to S. S. White, 1827 Perrysville Ave., N. S. Pittsburgh. Est. $150,000. Noted Oct. 9.

Que., Montreal—St. Laurent College, re-erecting church of St. Andrews and St. Paul, on college grounds, to A. Dufresne, 1832 bl. Pie IX. Est. $225,000.

SCHOOLS

PROPOSED WORK

Calif., Los Angeles—University of California, 405 Hilgard Ave., Westwood, plans by R. D. Johnson, Architects Bldg., rein.-con. memorial chapel, Highland Ave. $150,000.

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Calif., Los Angeles—University of California, 405 Hilgard Ave., Westwood Sts., plans by D. McLellan, 806 Architects Bldg., 3 story, basement, 150 x 200 ft. women's dormitory, rein.-con., concrete, plaster, cast stone, tile, marble, Manning and Westwood Aves. $300,000. G. W. Kelham, 315 Montgomery St., San Francisco, superv. archt.

Calif., Los Angeles—University of California, 405 Hilgard Ave., Westwood, plans by D. H. McLellan, Architects Bldg., 3 story, basement, 126 x 160 ft., rein.-con. dormitory, Hillard St. $250,000.

Conn., Bristol — City, W. P. Fraser, chn., Junior High School, 16 room brick, steel. To exceed $150,000. Architect not selected.

Ill., Monmouth — Monmouth College Assn., D. M. McMichael, bus. mgr., sketches William Stetson Memorial Fine Arts Building, 2 story, basement, brick, stone, Bway. $200,000. **Maturity in 1931.**

Ill., Wilmette—National College of Education, 2770 Sheridan Rd., Evanston, M. Kearns, secy., plans by Schmidt, Garden & Erickson, 104 South Michigan Ave., Chicago, 2 story, 174 x 214 ft. girls dormitory, concrete, brick, stone. $150,000.

Ind., Indianapolis—School Comrs., A. B. Good, dir., 150 North Meridian St., plans by McGuire & Shook, 941 North Meridian St., Grade School 82, rein.-con., brick, English and Emerson Aves. $150,000. Bevington-Williams, Inc., 1139 K. of P. Bldg., engrs.

Me., Farmington — Town, School Dpt., 2 story, basement, brick, Quebec St. $125,000-$150,000. Architect not selected.

Me., Portland—Waynflete Latin School, c/o J. P. Thomas, archt., 537 Congress St., sketches school. $150,000 or more.

Me., Waterville—City, G. Towne, chn. School Bd., 135 Main St., altering and constructing 2 story, basement, brick high school addition. $150,000. Architect not selected.

Mass., Cambridge—Massachusetts Institute of Technology, Charles River Rd., 2 story, basement, rein.-con. spectroscopic laboratory, off Massachusetts Ave. and Memorial Dr. $150,000. C. T. Main, Inc., 201 Devonshire St., Boston, engrs.

Mass., Cambridge—Parish of Our Lady of Pity (Roman Catholic), A. Millett, pastor, 35 Middlesex St., plans by J. G. Morissette, 575 145 ft., brick, stone school, plain found., North Essex St., Lawrence, 2 story, basement, 85 x Cambridge Sect. $200,000.

Mass., East Boston (sta. Boston) — City of Boston, Dpt. School Buildings, soon takes bids 2 story, basement, brick, limestone, plain found., Chapman Dist. $200,000.

Mass., Everett—City, M. C. O'Neil, mayor, City Hall, plans by McLaughlin & Burr, 88 Tremont St., Boston, Junior High School, 2 story, basement, brick, stone, steel, plain found., Bway. $150,000. Noted Mar. 27.

Mass., Hyde Park — City of Boston, Supt. School Buildings, school, Readville Sect. To exceed $150,000. Architect not selected.

Mass., Malden (br. Boston)—City, Building Comn., W. A. Hastings, plans high school. To exceed $150,000. Architect not selected.

Mass., Taunton—Holy Rosary Parish, 80 Bay St., revised plans by J. I. Higgins, Borden Blk., Fall River, 2 story, basement, brick, stone parochial school, auditorium, plain found., Bay St. $150,000.

Mass., Waltham—City, P. J. Duane, mayor, City Hall, 3 story, basement, brick school, Crescent St. $150,000 or more. Architect not selected.

Mich., Detroit—Bd. Educ., 1354 Broadway Ave., plans by B. C. Wetzel Co., 2317 Dime Bank Bldg., 2 story, basement, brick, steel, plain found., Guest School site. $235,315.

Mich., Detroit — Bd. Educ., 1354 Broadway Ave., plans by Stratton & Hyde, 904 Marquette Bldg., 2 story, basement, brick, steel, stone, rein.-con. addition to Cerdeney School, plain found., Pilgrim Ave. $232,790.

Mich., Flint—Bd. Educ., C. J. Ross, pres., plans by Malcolmson, Higginbotham & Trout, 1217 Griswold St., Detroit, 2 and 3 story, basement, brick, steel, rein.-con., stone, plain found., Longfellow site. $300,000.

N. H., Manchester—City, Mayor's Office, City Hall, additions to West and Central High Schools. $150,000 or more. Architect not selected.

N. J., Clifton — Bd. Educ., High School, 2 story, basement addition to School 15, Highland Ave. Project in abeyance. $150,000. Noted Sept. 25.

N. J., Hasbrouck Heights — Bd. Educ., Administration Bldg., 2 story, basement addition to Franklin School. $200,000. Project abandoned. Noted Oct. 30.

N. J., Highland Park—Bd. Educ., 2 story, basement, brick, steel addition to Franklin Junior High School, Mahar Tract. $150,000 or more. Architect not selected.

N. J., Irvington (br. Newark)—Bd. Educ., 1253 Clinton Ave., plans by V. A. Strombach, 1243 Springfield Ave., Junior High School, 3 story, Myrtle Ave. and Delmar Pl. $620,000. Noted Oct. 30.

N. J., Montclair—State Bd. Educ., Trenton, auditorium, class rooms at Montclair Normal School. $405,000.

N. J., Paterson—State Bd. Educ., Trenton, new building, other improvements at State Normal School. $1,700,000.

N. J., Piscataway town—Bd. Educ., Raritan Twp., revised plans by Jensen & Rasmussen, 218 Smith St., Perth Amboy, 2 story, basement brick, steel addition to Oak Tree School. $150,000. Noted Oct. 9 Daily.

N. J., Princeton — Princeton Theological Seminary plans by C. Z. Klauder, 1429 Walnut St., Phila., Pa., 2 story, basement, brick, stone administration building and social center, campus between Alexander and Brown Halls. $900,000. Noted Oct. 30.

N. Y., Amsterdam—Bd. Educ. new school, Northampton Sect. $30,000. Architect not selected.

O., Cleveland—Bd. Educ., F. G. Hogen, dir., plans by G. M. Hopkinson, Auditorium Garage Bldg., 2 story, basement, 13 room, brick, steel, concrete, Larchmont Ave. $250,000.

O., Cleveland—Bd. Educ., F. G. Hogen, dir., plans by G. M. Hopkinson, Auditorium Garage Bldg., 3 story, basement, brick, steel, concrete, East 131st St. $400,000.

O., Oakwood — Bd. Educ., A. E. Claggett, supt., plans by Schenk & Williams, 3rd Natl. Bldg., Dayton, 3 story, basement, brick, rein.-con., stone high school, plain found., Far Hills Ave. $360,000 voted for same.

R. I., Cranston (mail Providence) — City, School Bd., soon takes bids 2 story, basement, brick, stone, plain found., Gardner St., $150,000 or more. W. R. Walker & Son, 49 Weybosset St., Providence, archts. Noted Nov. 6.

Tex., Austin—Texas University Bd. Regents, c/o J. W. Calhoun, comptroller, plans by H. M. Green, La Roche & Dahl, 307 Constr. Industrial Bldg., Dallas, brick, stone, rein.-con. library addition, campus.

Tex., Galveston—University of Texas Bd. Regents, c/o J. W. Calhoun, comptroller, Austin, plans by H. M. Green, La Roche & Dahl, 307 Constr. Industrial Bldg., Dallas, 4 story, brick, stone, rein.-con. laboratory at Medical Branch University. Noted Aug. 14.

Tex., San Antonio—Bd. Educ., Lavaca and Water Sts., plans by Phelps & DeWees, 628 Gunter Bldg., 2 or 3 large school buildings, incl. trade school, junior high school. $1,750,000, election soon for same.

Ont., Niagara Falls—Bd. Educ., 471 Victoria Ave., 2 story, 10 room, brick, stone, concrete found. $150,000. Architect not selected.

BIDS ASKED

Del., Greenwood—Delaware School Foundation, A. J. Taylor, vice pres., Du Pont Bldg., Wilmington, bids about Dec. 15, general contract 3 story, basement, brick, steel, rein.-con. high school addition, plain found. $150,000. Guilbert & Betelle, 20 Branford Pl., Newark, N. J., archts. Noted Oct. 16.

Ind., Ft. Wayne—Nov. 25, by School Comrs., concrete, steel, brick school. $150,000. L. Bowers, 4435 South Calhoun St., archt.

Ind., Richmond—Nov. 15, by School Comrs., 4 rein.-con., brick grade school buildings and additions. $175,000. Hamilton-Fellows & Medved, 814 Tower Court, Chicago, Ill., archts.

La., New Orleans—Dec. 2, by Bd. Educ., 3 story, 136 x 273 ft., brick, stucco, stone, pile and rein.-con. found., Court St. $250,000. E. A. Christy, City Hall Annex, archt.

Md., Baltimore — Nov. 19, by Bd. Awards, East Baltimore Junior High School, 4 story, basement, 101 x 258 ft., brick, hollow tile, structural steel, cut stone, Caroline and McElderry Sts. $700,000. Taylor & Fisher, Baltimore Trust Bldg., archts. H. F. Doelemar, Baltimore Trust Bldg., engr.

Mass., Arlington—Nov. 17, by Bd. Selectmen, 2 story, basement, 165 x 175 ft., brick, limestone high school, plain found., Mass. Ave. $275,000; electrical work, $25,000; plumbing, $25,000 or more; heating and ventilating, $25,000 or more. Noted Oct. 30.

Mass., Fairhaven—Nov. 24, by Town, W. B. Gardiner, 2 story, basement, brick, steel high school addition, Larch Ave., $200,000, heating, plumbing, electrical work, to exceed $25,000. W. Tallman, 222 Union St., New Bedford, archt. Noted Oct. 23.

Mass., Hyde Park—Nov. 20, by City of Boston, Dpt. School Buildings, 2 story, basement, brick, plain found., Henry Drew Dist. $150,000. J. M. Gray & J. P. Hefferman, 175 High St., Boston, archts. Noted Aug. 21.

Mo., St. Louis—St. Louis University, Grand and West Pine Sts. bids about Nov. 16, School of Commerce and Finance, 5 story, basement, 125 x 184 ft., Lindell Blvd. west of Grand Blvd. H. P. Hess, 1001 Ambassador Bldg., archt. Noted Sept. 4.

N. J., Hillside (sta. Elizabeth)—Bd. Educ., Township Hall, bids about Dec. 15, general contract 2 story, basement, brick, steel, rein.-con., plain found., Conant and Winchester Aves. $175,000. J. Wind, Jr., 1450 North Broad St., archt. Noted Oct. 23.

N. J., Roselle—Bd. Educ., W. F. Bigelow, pres., bids about Dec. 1, general contract high school. $360,000. H. B. Brady, Inc., 333 Broad St., Elizabeth, archt. Noted Aug. 21.

N. J., Rutherford—Bd. Educ., High School, bids about Dec. 15, 2 story, basement, brick, steel, rein.-con. addition to Washington School, Wood St. $150,000. E. I. Williams, 131 West Passaic Ave., archt. Noted Oct. 16.

N. Y., New York—Nov. 20, by W. C. Martin, archt. and supt. School Buildings, Flatbush Ave. extension and Concord St., Brooklyn, general contract P. S. 76, Adee Ave. from Radcliff to Ironwood Aves., for Bd. Educ., 500 Park Ave. Noted Oct. 30.

Schools (Continued)

O., Youngstown—Nov. 15, by P. Boucherle, archt., 301 1st Natl. Bank Bldg., 3 story, basement, 88 x 115 x 143 ft., brick, steel, concrete, Wick Ave., for Y. M. C. A., L. T. Skeggs, genl. secy., 17 North Champion St. Est. $200,000.

Pa., Grove City—Nov. 19, by W. G. Eckles, archt., Lawrence Savings & Trust Bldg., New Castle, 3 story, basement, 49 x 205 ft. men's dormitory, brick, hollow tile, steel, with 34 x 87 ft. wing, for Grove City College, W. Clause, pres. Bd. Trustees, c/o Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh. Noted Oct. 9.

Pa., York—Nov. 17, by D. N. Crider, secy. Bd. Educ., 2 story, 50 x 100 ft. and 145 x 200 ft., basement, rein.-con., brick, steel, plain found., West End. R. A. Stair, Guarantee Trust Bldg., archt.

Tex., Austin—Nov. 26, by Texas University Bd. Regents, c/o J. W. Calhoun, comptroller, Austin, 5 story, 54 x 200 ft., brick, stone, rein.-con. class room building, campus. $350,000. H. M. Green, La Roche & Dahl, 307 Constr. Industrial Bldg., Dallas, archts.

Wis., Wauwatosa—Nov. 24, by W. T. Darling, secy. Bd. Educ., 3 story, basement, 127 x 138 ft., brick, tile, terra cotta, Wauwatosa St. Herbst & Kuenzli, 653 Franklin Pl., archts.

Ont., Waterloo — Nov. 17, by Bd. Educ., M. E. Braendle, secy., 44 George St., 2 story, basement, concrete, brick, steel, plain found., Moore St. $160,000. F. W. Warren, Federal Bldg., Hamilton, archt. Noted Oct. 23.

CONTRACTS AWARDED

Calif., Antioch — Bd. Trustees Antioch-Live Oak High School Dist., general contract 2 story, brick high school, to Mathews Constr. Co., Forum Bldg., Sacramento. $125,350. Noted Sept. 18.

Conn., Middletown—City. Bd. Educ., Senior-Junior High School, 3 story, basement, 60 x 210 ft., brick, steel, to L. Baldwin, Long Hill St., $218,070. Noted Oct. 23.

Ind., Gary—School Comrs., general contract 3 story, 187 x 295 ft., rein.-con., brick, to General Constr. Co., 479 Bway., $428,558; heating and ventilating to E. M. Pripps, Gary, $71,742; electrical work, to Lighthouse Co., Gary, $49,907. Grand total $550,207. Noted Oct. 9.

Ind., Harrisburg—Bd. School Comrs., general contract Consolidated Grade and High School, 2 story, basement, 48 x 110 ft., brick, rein.-con., to C. Michael, Liberty Center. Est. $150,000. Noted Oct. 8.

Md., Baltimore — Bd. Awards, altering and constructing 3 story, brick, concrete school addition, to P. C. Streett Eng. Co., 404 St. Paul St., $168,000. Noted Oct. 9.

Mass., Jamaica Plain (sta. Boston)—City of Boston, Dpt. School Buildings, 2 story, basement, 260 x 280 ft., brick, limestone, elementary school, plain found., Agassiz Bowditch Dist., to M. Cummings Co., 43 Tremont St., Boston, $690,000. Est. $600,000. Noted June 26.

Mass., North Randolph—Town of Randolph, F. Chapin, chn. School Com., 2 story, basement, brick, stone, plain found., Old St., to Suffolk Constr. Co., Inc., 70 Norwell St., Dorchester. Est. $150,000; heating and ventilating, to McLean & Cousens Co., 65 Chandler St., Boston, plumbing and gas, to T. A. Paradis, 262 Copeland St., Quincy, electrical work, to M. B. Foster Electric Co., 514 Atlantic Ave., Boston, est. $25,000. Noted Oct. 23.

Mo., Kansas City—Bd. Educ., general contract 2 story, basement, 62 x 128 ft., brick, rein.-con., stone addition, to A. T. Harper Constr. Co., 6235 East 13th St. Est. $150,000.

Mont., Missoula—Missoula Co., R. H. Smith, chn. School Bd., general contract 3 story, basement, 78 x 140 ft., rein.-con., brick school addition, to J. E. Hightower, Missoula, $134,736. Noted July 31.

N. J., Fort Lee—Bd. Educ., J. F. Whitteaker, pres., High School, Lemoine Ave., general contract 2 story, basement, brick, steel addition to School 4, plain found., to F. and C. Haerter, 765 Dewey Ave., West New York. Est. $150,000. Plumbing, to W. Zabransky, 19 Picken St., Little Ferry; heating and ventilating, to R. G. Maupai Co., 73 South St., Jersey City; and electrical work, to A. Neri, Inc., 928 Washington St., Hoboken. Noted Oct. 9.

N. J., Morristown—E. G. Perrot, archt., 1211 Arch St., Phila., Pa., general contract 2 story, basement, brick, steel gymnasium addition, to F. N. Graham, Masonville, for Our Lady of Good Council Church. Est. $150,000. Noted Nov. 6.

N. J., Summit—Bd. Educ., 272 Morris Ave., general contract Franklin School, 2 story, basement, brick, steel, to G. Falco, 602 1st Ave., Elizabeth; plumbing, to R. B. Smith, Inc., 62 Ann St., Newark; electrical work, to R. A. Ebert, Inc., 384 South 10th St., Newark. Est. $150,000. Noted Oct. 9.

N. J., Summit—Bd. Educ., 272 Morris Ave., general contract Jefferson School, 2 story, basement, brick, steel, in East Summit, to G. Falco, 602 1st Ave., Elizabeth, $104,300; plumbing, to W. J. Patterson, 717 South Orange Ave., Newark, $9,252; heating and ventilating, to Burns, Lane & Richardson Co., 1107 Broad St., Newark, $14,892; electrical work, to Interstate Electric Co., 377 Jewett Ave., West New Brighton, N. Y., $5,800. Grand total $134,244. Noted Oct. 9.

N. Y., Syracuse—Bd. Contr. & Supply, City Hall, general contract Eastwood School, to Shane Constr. Co., Hills Bldg., $197,278. Noted Oct. 29 Daily.

N. D., Minot—State Bd. Administration, Bismarck, general contract, 3 story, basement, 40 x 168 ft. women's dormitory, rein.-con., Minot State Teachers College, to J. H. Mackley, Minot, $83,794. Noted Oct. 16.

O., Canton—City, 2 story, basement, brick, stone school, incl. classrooms, gymnasium, auditorium, clinic room, lockers, Rowland Ave. E., to H. S. Melbourne Co., 2101 Woodland Ave., N. W., $159,148; plumbing, heating and ventilating, to Standard Plumbing Heating Co., 435 Walnut Ave. S. E., $29,285. Wiring, to Spring Bros. Electric Co., Canton, $6,678.

O., Cincinnati — University of Cincinnati, Clifton Ave., 4 story, basement, 160 x 190 ft., brick, rein.-con. college of education building, plain found., campus, to Midland Building Co., 2413 Burnet St., $360,531.

Tex., San Benito — Bd. Educ., c/o A. L. Harris, San Benito, 2 story, brick, hollow tile, rein.-con. high school, to Merriwether & Sauer, San Benito, $133,962. Est. $250,000.

Wis., Beloit — Beloit College, general contract 3 story college addition, to Cunningham Bros., Beloit. Est. $200,000. Noted Aug. 21.

Wis., Milwaukee—Bd. School Directors, excavating ,concrete and cement for Garden Homes School, 3 story, 126 x 130 ft., Teutonia Ave., to Hunzinger Constr. Co., 424 East Wells St., $90,868; masonry work, to P. W. Bruige Co., 940 3rd St., $57,960; cut stone to Erdmann Cut Stone Co., 41st St. and Custer Ave. $6,323; lath, plaster, to E. Jahn Plaster Corp., 425 East Water St., $17,482; tile work, to H. Neidner & Co., 519 East Water St., $2,124; terrazzo, to American Marble & Mosaic Co., 740 West Water St., $8,984; marble and slate blackboards, to W. Salmon Marble Co., 716 South Pierce St., $4,972 and $1,782 respectively; refrigerating, to Universal Refrigerating Co., 3009 North Ave., $2,000; carpentry, to J. P. Jansen, 1279 39th St., $31,990; painting, to H. Weden Co., 601 Jackson St., $3,988; hardware, to Kolloge Hardware Co., 367 3rd St., $3,385; plumbing, to Wenzel & Henoch Co., 498 27th St., $17,314; heating and ventilating and sheet metal, to Downey Heating Co., 1729 St. Paul Ave., $29,794 and $11,625 respectively; heat regulating, to Natl. Reg. Co., 1007 Winnebago Ave., $4,784; electrical work, to Schultz & Fisher, Inc., 1 Erie St., $11,326; electrical fixtures, to A. C. Electric Co., 718 Winnebago Ave., $2,555. Grand total $319,256. Noted Oct. 24 Daily.

Ont., Fort William — Bd. Educ., W. W. Southon, secy., general contract 3 story, basement, 175 x 200 ft., brick, steel, concrete Main St., to J. Tocheri, 1010 Donald St., $411,875. Wants prices on equipment for machine shop chemistry and physics laboratories. Noted Oct. 16.

Ont., Toronto—S. S. No. 35, J. Knox, secy., 188 Rosethorne Ave., Silverthorn, Toronto, 10 room brick, stone, top addition to school, York Twp., masonry contract to J. S. Laxton, 34 Parkdale Rd.; carpentry, to Jordan & Hanson, 666 Rhodes Ave.; plumbing and heating, to W. J. Griffiths & Sons, 1451 Queen St.; electrical work, to Canada Electric Co., 175 King St. E. Est. $150,000.

THEATRES

PROPOSED WORK

Colo., Denver—See "Contracts Awarded."

Ind., East Chicago—Public Theatres Co., 175 North State St., Chicago, Ill., plans by Newhouse & Bernham, 8 South Michigan Ave., 3 story, basement, 60 x 150 ft., 1,250 seating capacity, rein.-con., brick terra cotta, Chicago Ave. $150,000.

Mass., Brookline—Owner, c/o Krokyn & Brown, archts., 120 Milk St., Boston, sketches theatre. To exceed $150,000.

N. Y., Fulton—W. Mitchell, plans by J. F. Schindler, 430 South Salina Ave., Syracuse, 2 story, 120 x 132 ft., brick, steel, cast stone theatre. $150,000.

O., Elyria — Paramount Publix Theatres, Paramount Bldg., New York, bids after Nov. 15, general contract theatre. Rapp & Rapp, Paramount Bldg., New York, N. Y., archts. Test borings under way.

BIDS ASKED

Va., Roanoke—Nov. 19, by Paramount Publix Theatres, Paramount Bldg., New York, general contract theatre. To exceed $150,000. Rapp & Rapp, Paramount Bldg., New York, archts.

CONTRACTS AWARDED

Calif., Los Angeles—H. E. Rawlingson, c/o Conservatory of Music, 13 story, rein.-con. theatre, store, 12th and Vermont Sts., to Winter Constr. Co., 1411 North Stanley Ave., $300,000.

Colo., Denver—R.K.O. Theatres, Western Div., Chicago, Ill., G. H. Brown, in charge, awarded contract theatre. Contractor not disclosed. Est. exceeds $1,000,000. Now taking bids for 600 tons steel.

Ia., Davenport — Third and Brady Street Corp., owner, c/o G. M. Bechtel, dir., and United States Realties Co., lessee, 9 story, 150 x 192 ft., rein.-con., brick, steel, stone, terra cotta theatre, hotel, to Lundoff-Bicknell Co., 100 North La Salle St., Chicago, Ill. Est. $2,000,000. Noted Oct. 16.

N. Y., Albany — R. K. O. Theatre, 1664 Bway., New York, general contract theatre, North Pearl St. and Clinton Ave., to M. Shapiro & Sons, 1560 Bway., New York. Est. $3,000,000. Noted Oct. 23.

N. Y., Schenectady—R. K. O. Theatres, 1564 Bway., New York, general contract theatre, to M. Shapiro & Sons, 1560 Bway., New York. Noted Sept. 11.

BANKS

PROPOSED WORK

Ill., Bloomington—McLean County Bank, L. Rush, pres., plans by Burnham Bros., Inc., 160 North La Salle St., Chicago, 12 story, basement, incl. offices, limestone, brick, rein.-con., plain found., East St. $500,000. **Maturity in 1931.**

BIDS ASKED

N. Y., Syracuse — Onondaga County Savings Bank bids about Nov. 24, general contract altering bank. $500,000. Halsey, McCormick & Helmer, Inc., 286 5th Ave., New York, archts. Noted Oct. 2.

CONTRACTS AWARDED

O., Hamilton — Second National Bank, 2 story, basement, stone, concrete, steel, bank, office, to F. K. Vaughan Building Co., Hamilton. Est. $300,000. Noted Oct. 16.

O., North Canton (br. Canton) — Citizens Building & Loan Co., 114 Market Ave., N., Canton, 2 story, brick, limestone bank, Main and Portage Sts., to I. A. Ream, 839 Market St. N., Canton, $150,000.

OFFICES

PROPOSED WORK

Ill., Peoria—Keystone Steel & Wire Co., South Bartonville, C. W. La Porte, assistant to pres., plans by Hewitt-Emerson-Gregg, Peoria Life Bldg., 20 story, 70 x 100 ft., brick, steel, rein.-con., in suburb. $150,000. **Maturity 1931.** J. C. Hewell, c/o owner, engr.

Mass., Boston—Tomfohrde Building, A. P. Pearce, Jr., trustee, 15 State St., rejected bids altering 4 story, basement, brick, steel office, 37-51 Court St. $150,000. Blackall, Clappe & Whittemore, 31 West St., archts. Noted Oct. 23.

N. J., East Orange—Baldwin Constr. Co., 614 Central Ave., sketches by Warren & Warren, 31 Clinton St., Newark, 2 story, basement, office, store addition, Central Ave. $150,000. Noted Aug. 28.

N. J., Montclair—Pub. Serv. Production Co., 80 Park Pl., 1 story, basement office, garage, shops, 101 Greenwood Ave. $150,000. Project in abeyance. Noted Sept. 18.

N. J., Newark — Majestic Radio Co., 259 Madison Ave., Perth Amboy, 2 story, basement, 40 x 150 x 250 ft., brick, steel office, warehouse, showrooms, Frelinghuysen Ave. $150,000. Project in abeyance. Noted Nov. 6.

N. J., Newark—Owner, c/o Y. Matsui, archt., 101 Park Ave., New York, sketches 20 story office, loft, Park Pl. and Passaic River. $8,000,000.

N. Y., Paterson—Erie R.R. Co., G. S. Fanning, ch. engr., 50 Church St., New York, revised sketches 10 story, basement, brick, steel office, railroad station, Ward St. $500,000.

Tex., Borger—A. P. Borger, R. F. Bailey, Borger, and F. W. Kellar, Wichita Falls, soon take bids 7 story, basement, 100 x 125 ft., brick, rein.-con., incl. stores, hotel, plain found. $150,000. Private plans.

BIDS ASKED

N. J., Paterson — Goodman & Shulman, archts., 20 Smith St., bids about Dec. 21, general contract 10 story, basement, 50 x 75 ft., brick, steel medical tower office building, Bway. and Auburn St., for Medical Tower Building Corp., c/o architects. $600,000. Noted Oct. 16.

O., Dayton—Dec. 3, by Schenck & Williams, archt., 3rd Natl. Bldg., superstructure incl. rein.-con. work, metal work, heating, ventilating, electrical wiring, for 20 story, rein.-con., steel office, bank building, West 2nd St., for Mutual Home & Savings Assn., 2nd and Main Sts. Total $1,000,000. Noted Oct. 9 under "Contracts Awarded."

CONTRACTS AWARDED

Mass., Boston—Owner, c/o F. A. Norcross, 46 Cornhill, archt., altering and reconstructing 4 story, basement, brick, stone, steel doctor's office building, 475 Commonwealth Ave., to N. Hurwitz, 294 Washington St. $150,000.

Tex., Dallas—Dallas Gas Co., 2016 Jackson St., general contract completing 13 story, basement, brick, stone, rein.-con., steel office building, foundation to carry 23 stories, Jackson and Harvard Sts., to Joplin Constr. Co., Fidelity Union Bldg., Dallas. $473,350.

STORES

PROPOSED WORK

N. Y., Jamaica—Gross Constr. Co., 160-16 Jamaica Ave., plans by M. Klein, 65 Court St., Brooklyn, 2 story, 110 x 193 ft. stores, Jamaica Ave. and 164th St., $185,000.

O., Canton — Stark Dry Goods Co., S. Erlanger, mgr., 200 Tuscawaras Ave., plans by Albrecht & Wilhelm, 1900 Euclid Bldg., 4 story, basement, 33 x 200 ft., brick, steel, terra cotta, concrete department store, East Tuscawaras Ave. $250,000.

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Stores (Continued)

CONTRACTS AWARDED

Mass., Haverhill—M. and J. Bloomfield, c/o C. V. Badger, archt., 50 Merrimac St., 5 story, basement, 100 x 115 ft., brick store, office, ballroom, plain found., to J. V. Currier, 446 Groveland St. Est. $150,000 or more. Noted Sept. 25.

LOFTS

BIDS ASKED

Ill., Chicago—Leichenko & Esser, archts., 38 South Dearborn St., taking bids 2 story, basement, 135 x 145 ft., rein.-con., stone, incl. stores, 3129-41 Lincoln Ave., for S. H. Goldberg, 20th St. and Prairie Ave.

PUBLIC

PROPOSED WORK

Ind., Hammond—CITY HALL—Bd. Wks. bids in December, 4 story, basement, 75 x 195 ft., rein.-con., Indiana limestone, Maywood Park. $40,000. Hammond-Skidmore & Wainwright, 611 Holman St., archts. Noted July 24.

Kan., Alma—COURT HOUSE—Wabaunsee Co., A. N. Winkler, clk., plans by W. E. Glover, 301 National Reserve Bldg., Topeka, 3 story, ground floor, 69 x 103 ft., rein.-con., brick, Carthage or Bedford stone. $150,000.

La., Baton Rouge — CAPITOL — State of Louisiana, c/o H. P. Long, gov., voted $5,000,000, equivalent to 26 story, rein.-con., steel, limestone, hollow tile, concrete found., Church St. between 3rd and 5th Sts. Weiss, Dreyfus & Seiferth, Maison Blanche Bldg., New Orleans, archts. Noted Oct. 23.

Mass., Boston—SUPREME COURT—Commonwealth of Massachusetts, State House, supreme court building, on State House Grounds. Est. exceeds $150,000. Architects not selected.

Mass., Newton—LIBRARY—City, S. Weeks, mayor, City Hall, library, Chaffin Estate. $150,000 or more. Architect not selected.

Mass., Northhampton—POLICE BARRACKS—Commonwealth of Massachusetts, State Police Div., State House, Boston, sketches by G. P. B. Alderman & Co., 316 High St., Holyoke, state police barracks at Laurel Park Junction. $150,000. Noted Oct. 9.

Mass., Worcester—ARMORY—Commonwealth of Massachusetts, Adjutant General's Office, State House, Boston, armory. To exceed $150,000. Architect not selected.

Mich., Kalamazoo—CITY HALL, etc.—City plans by Weary & Alford, 1923 Calumet Ave., Chicago, Ill., 3 story, basement, stone, marble, city hall and office building, Bronson Park. $500,000.

N. J., Jersey City—HALL of RECORDS—Bd. Freeholders Hudson Co., Court House, revised sketches by J. T. Rowland, Jr., 30 Journal Sq., Hall of Records Building. $150,000. Noted Mar. 14.

N. J., Jersey City—LIBRARY—Bd. Trustees Free Public Library, 472 Jersey Ave., 2 story, basement, brick, steel, Summit and Magnolia Aves. $150,000. Project in abeyance. Noted Sept. 18.

N. J., Newark—JAIL—Bd. Freeholders Essex Co., Hall of Records Bldg., brick, steel, Newark St. $150,000 or more. Project in abeyance. Noted Sept. 25.

N. Y., Long Island City—POLICE STATION—Police Dpt., 240 Center St., New York, plans by T. O'Brien, 240 Center St., New York, 69 x 100 ft. police station, 101 St. and Liberty Ave. $175,000.

Ont., Hamilton—JAIL—City plans by Hutton & Souter, Bank of Hamilton Bldg., altering 3 story, basement jail. $150,000.

BIDS ASKED

N. J., Irvington (br. Newark)—FIRE HOUSE—Bd. City Council, 1253 Clinton Ave., bids about Dec. 15, 2 story, basement, brick, steel, Grove St. and 18th Ave. $150,000. G. F. Lederer, 2 Union Ave., archt. Noted Oct. 30.

Tex., Cotulla—COURT HOUSE and JAIL—La Salle Co. taking bids 3 story, part basement, brick, rein.-con., plain found. $150,000. H. T. Phelps, Hicks Bldg., San Antonio, archt. Noted Oct. 30.

Tex., Crowell—JAIL—Nov. 24, by Foard Co., c/o J. E. Atcheson, judge, 2 story, brick, steel jail. F. H. Leinbach, 805 Central Bank Bldg., Dallas, archt.

Ont., Sandwich—COURT HOUSE and JAIL—Essex Co. Council, bids about Jan. 1, court house and jail addition, Sandwich St. $200,000, Architect not selected.

CONTRACTS AWARDED

Calif., Ventura—COURT HOUSE and JAIL—Ventura Co., general contract 3 story, 62 x 118 ft., court house, 3 story, 42 x 118 ft., jail, rein.-con., terra cotta, Ventura St., to Union Eng. Co., 5905 Pacific Blvd., Huntington Park, $198,978. Noted Sept. 4.

Mich., Ypsilanti—DORMITORY, etc.—State, Administrative Bd., Lansing, general contract 2 and 3 story, basement, brick, steel, concrete employee's building and staff apartment, plain found., to A. J. DeKoning Co., Kalamazoo, $209,666; general contract superintendent's residence, to Spence Bros., Saginaw, $40,220. Noted Oct. 9.

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BUILDINGS—UNCLASSIFIED

PROPOSED WORK

Calif., La Jolla—LABORATORY—Scripts Institute of Oceanography plans by L. J. Gill, Sefton Bldg., Los Angeles, 2 story, basement, rein.-con. laboratory. $150,000.

Ill., Peoria—HOME—Christian Buehler Estate, c/o E. F. Cashin (in charge), 131 Columbia Terrace, plans by H. B. Dox, Lehmann Bldg., Old Peoples Home, 2 or 3 story, Sheridan Rd. $175,000. **Maturity in spring.**

N. J., Lakewood—MOTION PICTURE STUDIO—Lakewood Studio Co., G. H. Glass, pres., c/o D. J. Scrocco, archt., 60 Park Pl., Newark, sketches 1 and 10 story tower, 200 x 800 ft. motion picture and radio broadcasting studio, Pine Forest Manor. $500,000. Noted Oct. 30.

CONTRACTS AWARDED

N. Y., Brooklyn—MAUSOLEUM—New York Mausoleum Assn., 7 DeKalb Ave., 2 story, 79 x 161 ft. mausoleum, Cypress Hills Cemetery, to Kenny-Gilzean Constr. Co., 20 Vesey St., New York. Est. $700,000. Noted Oct. 23.

Tex., Forth Worth—PRODUCE MARKET—Texas Ice & Refrigerating Co., C. Goodfellow, 1 and 2 story, brick, to T. S. Byrne, Fort Worth Natl. Bank Bldg. Est. $150,000. Noted Aug. 15.

Buildings

FACTORIES AND MILLS

PROPOSED WORK

Calif., Pomona — NEWSPAPER PLANT — Progress-Bulletin plans by L. Rogers, 2412 West 7th St., Los Angeles, 3 story, basement, 119 x 120 ft., rein.-con.

Calif., San Diego—NEWSPAPER PLANT—San Diego Union & Evening Tribune plans by L. Rogers, 2412 West 7th St., Los Angeles, 3 story, basement, 50 x 200 ft., rein.-con.

Calif., South Gate — MANUFACTURING PLANT — Philadelphia Quartz Co., 6th and Grayson Sts., Berkeley, steel frame, corrugated iron, W. E. Lyons, c/o owner, engr. $300,000.

Conn., Bridgeport—DAIRY PLANT—Clover Farms, Inc., 73 Sedgwick St., dairy and ice cream manufacturing plant, Sedgwick St. $200,000 or more. Architect not selected.

Conn., Stamford—WEAVE SHED—Barrymore Seamless Wiltons, Inc., plans by Ballinger Co., 12th and Chestnut Sts., Phila., Pa., 1 story, 193 x 453 ft., brick, plain found., Boston Post Rd.

Ill., Chicago—PRESS ROOM—Chicago Daily News, 2230 West 56th St., masonry and carpentry work 3 story, 80 x 196 ft. press room, 2230-38 West 56th St., to R. C. Wieboldt Co., 1412 West Washington Blvd. Est. $150,000.

Ill., Lincoln — FACTORY — Lincoln Casket Co., W. Dowling, pres., sketches 2 or 3 story addition, $75,000. **Maturity 1931.**

Ind., Ft. Wayne—PLANT—Fisher Bros. Paper Co., 18-20, West Columbia St., plans by A. M. Strauss, 415 Cal-Wayne Bldg., 3 story, basement, 30 x 150 ft., brick, concrete, steel, West Columbia St. $40,000.

Kan., Paola — GAS BOOSTER STATION — Phillips Petroleum Co., Bartlesville, Okla., gas booster station. $60,000. A. H. Riney, Bartlesville, Okla., engr.

Mich., Detroit — DRY ICE PLANT — Borin Bros. Coal & Ice Co., 1635 Westminster Ave., 2 story, brick, steel, rein.-con., 30,000 lb. daily, plain found., Linwood Ave. $400,000. Private plans.

Mo., Harrisonville—GAS BOOSTER STATION—Phillips Petroleum Co., Bartlesville, Okla., gas booster station, $60,000. A. H. Riney, Bartlesville, Okla., engr.

Mo., St. Louis—VENEER FACTORY—Flexwood Co., 919 North Michigan Ave., Chicago, Ill., and R. E. Pickrel, 4025 Clara Ave., sketches rein.-con., brick, Clara Ave. and Terminal Belt. $250,000.

N. J., Cranbury—FACTORY—Unexcelled Mfg. Co., Inc., T. Jardine, pres., 22 Park Pl., New York, fireworks factory. Project in abeyance. Noted Oct. 23.

N. J., Elizabeth — FACTORY — Fisher & Dackerman, 1153 Chestnut St., revised plans by W. L. Finne, 1201 East Grand St., altering and constructing 1 story, basement, brick, steel addition, plain found., Chestnut St. $40,000. Former bids rejected. Noted Oct. 16.

N. J., Perth Amboy—DAIRY PLANT—Ballinger & Co., archts., 100 East 42nd St., New York, soon lets general contract 1 and 2 story, basement, brick, steel, Fayette and Goodwin Sts., for Industrial Realty Co., c/o architects. Puritan Dairy Products Co., 683 New Brunswick Ave., lessee. Noted Oct. 23.

N. Y., Schenectady—REFRIGERATOR FACTORY—General Electric Co. (Refrigeration Div.) River Rd., refrigerator manufacturing plant. To exceed $40,000.

O., Circleville—MANUFACTURING—Corporation Co. of America, 112 West Adams St., Chicago, Ill., rebuilding manufacturing and storage plant, recently destroyed by fire. To exceed $40,000. **Maturity indefinite.**

O., Cleveland—PACKING PLANT—K. Kreinberg & W. A. Krasny, 3310 West 65th St., plans by L. Skolnik, Auditorium Garage Bldg., 1 story, basement, brick, rein.-con. addition. $40,000.

Okla., Alva — GAS BOOSTER STATION — Phillips Petroleum Co., Bartlesville, gas booster station, near here. $60,000. A. H. Riney, Bartlesville, engr.

Okla., La Verne—GAS BOOSTER STATION—Phillips Petroleum Co., Bartlesville, sketches gas booster station. $60,000. A. H. Riney, Bartlesville, engr.

R. I., Coventry—GAS PLANT—Coventry Gas Co., c/o Johnson Church & Co., archts., 149 Bway., New York, gas plant. $42,000.

R. I., West Warwick—GAS PLANT—Warwick Gas Co., c/o Johnson Church & Co., archts., 149 Bway., New York, gas plant. $40,000.

Tex., Borger—BOOSTER STATION—Phillips Petroleum Co., Bartlesville, Okla., gas booster station, near here. $60,000. Private plans.

Tex., Bryan—COMPRESS—Bryan Compress & Warehouse Co., cotton compress. Private plans.

Tex., Coleman—GLASS PLANT—Santa Anna Glass Co., Santa Anna, glass manufacturing plant. $100,000.

B. C., New Westminster — SAW MILL — Fraser Valley Tie & Timber Co., sawmill. $70,000. Wants prices on equipment.

Man., Winnipeg — ASSEMBLING PLANT — Leyland Motor Truck Co. Ltd., Leyland, England, assembling plant for trucks and buses. $200,000.

Ont., Gravenhurst—FACTORY—Rainbowcraft Ltd., T. Greavett, genl. mgr., soon takes bids motor boat factory and shops. $100,000.

Ont., Iroquois—MILL—Caldwell Linen Mills addition. $75,000.

Que., Montreal—WOOD FACTORY—W. T. Owen, wood mill. $75,000.

BIDS ASKED

Calif., Sausalito—BOAT and MOTOR PLANT—See "Contracts Awarded."

Colo., Pueblo—OIL REFINERY—See "Contracts Awarded."

N. J., Newark—BAKERY—H. Polder, archt., 242 Franklin Ave., Brooklyn, N. Y., taking bids general contract 1 story, basement, 50 x 100 ft., rein.-con., Arlington Ave. and 3rd St., for Brownell Realty Co., c/o Dugan Bros., Inc., lessee, 161 Arlington Ave. $40,000. Noted Oct. 30.

O., Canton—ICE PLANT—Canton Ice & Fuel Co., 1210 3rd St. N. E., bids about Dec. 4, 2 story, basement addition. $50,000. Private plans.

Tex., Raymondville — PACKING PLANT — Alexander Marketing Co., 740 West Stenger St., San Benito, taking bids 1 story citrus packing plant, timber. Private plans.

Tex., San Benito — PRODUCE PACKING PLANT — Etchison Produce Co., 595 Sam Houston Blvd., taking bids 1 story, 48 x 200 ft. plant, incl. cold storage facilities. Private plans.

Wash., Seattle—AUTO ASSEMBLY PLANT—Nov. 17, by A. Kahn, archt., 1000 Marquette Bldg., Detroit, Mich., 1 and 2 story, brick, steel, concrete, for Ford Motor Co., 3674 Schaefer Rd., Dearborn, Mich. $750,000. Noted July 17.

CONTRACTS AWARDED

Calif., Los Angeles — BAKERY — Van de Kamps Holland Bakeries, San Fernando Bldg., 2 story, 250 x 280 ft., rein.-con., to Pozzo Constr. Co., 421 Macy St., $350,000. Noted July 17.

Calif., Los Angeles—FACTORY—Rheem Mfg. Co., 4535 Horton St., Emeryville, 1 story, 210 x 400 ft., brick, steel, incl. 12 ft. loading platform, Firestone Blvd. and Rheem Ave., to Meyer & Holler, Wright & Callender Bldg., $100,000.

Calif., Martinez — OIL CRACKING PLANT—Associated Oil Co., 79 West Mtgy. St., San Francisco, and 17 Battery Pl., New York, oil cracking plant, 10,000 bbl. oil daily, at Avon, near here, to E. B. Badger & Son, 79 Pitts St., Boston, Mass., and 271 Madison Ave., New York. Est. $2,000,000.

Calif., Sausalito—BOAT and MOTOR PLANT—Italian American Motors Co., 604 Montgomery St., San Francisco, boat and motor plant, day labor, $40,000.

Colo., Pueblo—FACTORY—International Rubber Co., c/o R. C. Sudbury, Maine Hotel (1st unit), 80 x 125 ft., concrete, brick, steel, South Santa Fe Ave. and Missouri Pacific R.R., to H. O. Schmidt, 849 East Evans Ave. Owner soon takes bids on warehouse. Total est. $200,000. Noted Oct. 1.

Colo., Pueblo — OIL REFINERY — Rocky Mountain Refinery, Inc., c/o A. N. Bobbit, vice pres., 1633 East 6th St., (1st unit) brick, concrete, steel, Portland Ave. and Missouri Pacific R.R., day labor under supervision R. E. Stanton, engr., c/o owner. $100,000.

Ill., Chicago — LAUNDRY — Pullman Co., Adams St. and Michigan Ave., masonry and carpentry contracts 3 story, 87 x 274 ft., brick, 333 West 43rd St., to Van Etten Bros., 11016 Michigan Ave. Est. $182,000.

Ill., East St. Louis — PACKING PLANT — Circle Packing Co., 319 Winstanley Ave., 2

Factories and Mills (Continued)

story, 50 x 100 ft., rein.-con., concrete, brick addition, to F. Schmitt Contg. Co., Inc., 650 Rosedale Ave., St. Louis, Mo.

Ill., Libertyville — HUNTING EQUIPMENT FACTORY — Nimrod Co. 1 story, concrete, brick, to Libertyville Constr. Co., Libertyville. Est. $40,000. This corrects report in Oct. 30 issue under "Power Plants, Edwardsville."

Ind., New Albany—FERTILIZER PLANT—Hopkins Fertilizer Co., 150 x 180 ft., brick, steel, to E. Embry, New Albany. Est. $40,000.

Ind., South Bend—FACTORY—South Bend Bait Co., general contract 1 story, 100 x 100 ft., rein.-con., steel, to R. Sollitt & Sons, 518 East Sample St. Est. $40,000.

Mass., Boston—LAUNDRY—S. Heintzelman, 65 Austin St., Cambridge, 1 story, brick, concrete, steel, concrete found., Gibson and Brook Sts., to F. Santini Constr. Co., 15 Bowdoin St., Arlington. Est. $45,000.

Mass., Dorchester (sta. Boston) — BAKERY, etc. — S. Cole, 235 Bluehill Ave., 1 and 3 story, 55 x 100 ft., brick, steel bakery, warehouse, plain found., to N. Fritz Constr. Co., 62 Maywood St., Roxbury. Est. $40,000 or more. Noted Sept. 4.

Mass., Jamaica Plain (sta. Boston)—WOOD FINISHING PLANT—Merrimfan Bros., 185 Amory St., 1 story, irregular sized, brick, timber, plain found., rear 185 Amory St., to J. Schmidt, 19 Gilman St., Roslindale. Est. $40,000.

Mass., Wilmington—PACKING PLANT—Wilmington Packing Co., Inc., E. T. Murphy, rebuilding 3 story, concrete, concrete found., to Thomas Mulcare, Inc., 66 Western Ave., Brighton. Est. exceeds $40,000. Noted Oct. 16.

O., Cincinnati—FACTORY—Dubois Soap Co., 1120 West Front St., 4 story, brick, rein.-con., Front St., to Ben Schaefer Building Co., 215 Race St., $50,000.

O., Cincinnati—FACTORY, etc.—C. R. Talbott Co., 2245 Bogen St., 1 story, basement, brick, rein.-con. factory, office, to D. Meinken & Son, Barnard St. $75,000.

Okla., Oklahoma City — FACTORY — Fluid Packed Pump Co., 29th and Santa Fe Sts., 2 story, basement, 24 x 136 ft., brick, plain found., 29th St., to H. Reynolds, 636 East 7th St., Oklahoma City, Okla., $45,000.

Tenn., Nashville — FLAKING MILL — Tennessee Cereal Co., Independent Life Bldg., general contract 2 and 4 story, Franklin Pike, to Wagar Constr. Co., Norris Bldg., Atlanta, Ga., $56,000. Plumbing, heating, power plant, water filtration plant to be let later. Equipment bought.

Wash., Millwood—FACTORY—Inland Empire Paper Co., general contract 1 and 2 story, brick, steel, concrete addition, to Austin Co., 16112 Euclid Ave., Cleveland, O. Est. $300,000.

Wash., Yakima—CREAMERY—Yakima Valley Dairymen's Assn., general contract brick, steel, to Austin Co., 16112 Euclid Ave., Cleveland, O. Est. $50,000.

Wis., Bruce—CREAMERY—Abbots, Dairy, Inc., 31st and Cherry Sts., Phila., Pa., 2 story, basement, 95 x 128 ft., brick, rein.-con., to Siems, Helmers, Inc., 1014 Guardian Bldg., St. Paul Minn.; reinforcing steel, to J. T. Ryerson & Son, 1104 Plym. Bldg., Minneapolis, Minn.; millwork, to Smith & Wyman, Co., 129 Southeast 8th St., Minneapolis, Minn.; tile, to Belt Line Brick Co., 510 Baker Bldg., Minneapolis, Minn.; elevator, to Otis Elevator Co., 412 6th Ave. S., Minneapolis, Minn.

Ont., Sandwich—DISTRIBUTING PLANT—British American Oil Co. Ltd., Royal Bank Bldg., Toronto, 1 story, 48 x 130 ft. warehouse, and 60 x 80 ft. garage and 4 storage tanks for distributing station, brick, concrete, to Pinch & Bailey, 400 Gladstone Ave., Windsor. Est. $100,000. Noted Sept. 11.

Ont., Toronto—FACTORY—Sangamo Electric Co. of Canada Ltd., 179 George St., general contract 2 story, 40 x 100 ft., rein.-con. steel addition, to J. A. Wickett Ltd., 16 Saulter St.; electrical work, to Harris & Marsden, 81 A Parkway Ave.; plumbing and heating, to Bennett & Wright, 72 Queen St., E. Est. $50,000.

Ont., Weston—WOOL PLANT—Co-Operative Wool Growers Ltd., Reford Bldg., Toronto, general contract rebuilding 1 story, 100 x 200 ft., brick, steel, recently destroyed by fire, to Wells & Gray Ltd., Confederation Life Bldg., Toronto. Est. $50,000.

GARAGES

PROPOSED WORK

Mass., Arlington—Stuart-Marshall Realty Co., 825 Beacon St., Newtown, plans by C. J. S. White, 825 Beacon St., Newton, 1 story, concrete, steel service garage addition, Broadway and Alton Sts., $40,000. C. B. Perham, Inc., 925 Bway., lessee.

N. H., Manchester — H. E. Hartman, 11 Prospect St., revised plans by A. O. Osberg, 508 Manchester St., 2 story, 110 x 170 ft., concrete, steel service and repair garage, concrete found., Elm St. $75,000 or more.

N. J., East Orange—Charles Motors, Inc., 197 Central Ave., Newark, will not build garage, showroom, Central and Freeman Aves. Project abandoned. Noted Apr. 3.

N. Y., Brooklyn—M. Kessler, 211 West 106th St., New York, 73 x 117 ft. service garage, Hart Pl. and West 16th St. $60,000. Project in abeyance. M. Klein, 65 Court St., archt. Noted Sept. 11.

N. Y., Brooklyn—One Thousand Four Hundred Eight Pitkin Corp., A. W. Norek, pres., 66 Court St., sketches by H. J. Nurick, 44 Court St., 4 story service garage, store, Pitkin and Eastern Parkway. To exceed $75,000.

N. Y., New York — Realty Utilities Corp., F. A. Shaw, pres., 122 East 42nd St., plans by N. Rotholz, 122 East 42nd St., 75 x 173 ft. service garage, Jerome Ave. and 196th Sts. To exceed $40,000.

N. Y., New York—Seven Hundred Ten 12th Avenue Corp., N. Wallenstein, pres., 33 West 42nd St., plans by W. Shary, 22 East 17th St., 3 story, 200 x 225 ft. service garage, 643 West 51st St. $200,000.

Pa., Altoona—Goodrich Tire & Rubber Co., W. B. Thompson, in charge, 500 South Main St., Akron, O., soon lets contract 1 and 2 story, 49 x 163 ft., super service station, incl. sales room, office, drive, service garage with space in center, 3,500 sq.ft. floor space, 12th and 16th Sts. $40,000. Private plans.

BIDS ASKED

Conn., New Haven—Todd Rubber Co., 125 Whalley Ave., taking bids 1 story, brick, steel garage, service station, concrete found., Whalley Ave. $50,000. W. R. Shiner, 185 Church St., archt.

Me., Augusta—See "Contracts Awarded."

Mass., Falmouth—See "Contracts Awarded."

N. Y., New York—See "Contracts Awarded."

CONTRACTS AWARDED

Ill., Pekin—O. L. Cottingham, 420 Elizabeth St., 1 story, 70 x 95 ft., brick, stone garage, salesroom, Elizabeth St., to E. L. Rohrer, 1300 Market St., $40,000.

Me., Augusta—August Motor Sales Co., Powhattan St., 2 story, 70 x 100 ft., brick, steel service garage, plain found., State St., day labor, $50,000. Edward Sales Co., 443 Congress St., Portland, archts.

Mass., Lawrence—Morehouse Baking Co., 9 Mill St., 1 story, 70 x 170 ft., brick, concrete, steel garage, concrete found., to L. Cyr, 15 Melrose St. Est. $40,000 or more. Noted Nov. 6.

Mass., Falmouth—J. L. Nickerson, Main St., 1 story, irregular sized, concrete, steel service garage, concrete found., Hadden Ave. separate contracts. $40,000. Private plans .

SHOPS AND FOUNDRIES

CONTRACTS AWARDED

Mass., Pittsfield — TRANSFORMER TANK SHOP—General Electric Co., E. A. Wagner, genl. mgr., 1 story, 150 x 550 ft., steel; glass transformer tank shop, concrete found., to G. A. Fuller Co., 597 Madison Ave., New York. Est. $1,000,000. Noted Oct. 23.

N. Y., Brooklyn—WORK SHOP—Donigan & Nielson, 3rd Ave. and 24th St., work shop, 3rd Ave. and 24th St., to Ajello Constr. Co., 142 Montague St. Est. $40,000. Noted Oct. 23.

POWER PLANTS

PROPOSED WORK

Conn., Hartford—New England Electric Co., 103 Allyn St., plans by Westcott & Mapes, 139 Orange St., New Haven, 3 story, 70 x 90 ft., brick, steel, concrete service building, Spring St. and Church St. extension. $75,000.

Minn., McGregor—General Minnesota Utilities Co., Pine City, power plant. $80,000.

Pa., Oil City — Keystone Pub. Serv. Co., V. A. Redfield, genl. mgr., Drake Theatre Bldg., electric power plant. **Maturity probably not for couple of years.** Engineer not selected.

Tex., Plainview—Texas Utilities Co., Plainview, controlled by Am. Community Power Co., Planters Bldg., St. Louis, Mo., sketches steam-operated power plant, to use either oil or gas fuel at Tuco, near here. $425,000. Private plans.

Ont., London—Kellogg Co. of Canada Ltd., Dundas St., J. R. McKinley, mgr., plans by A. Kahn, 1000 Marquette Bldg., Detroit, Mich., new power house. $150,000.

BIDS ASKED

Calif., Herndon—See "Contracts Awarded."

Mo., Sikeston — Nov. 24, at office P. H. Stevenson, city clk., Sect. 1, 40 x 80 ft. brick power house building, 20,000 gal. oil storage, tank and cooling tower; Sect. 2, two 600 hp. diesel engines, generators, exciters and auxiliaries; Sect. 3, water softener for circulating water; Sect. 4, 8 panel, 1,200 kw. ultimate capacity swichboard; Sect. 5, electric distribution system, material f.o.b. cars; Sect. 6, constructing distribution system, tools and labor only; Sect. 7, furnishing, installing electric connections and station wiring, for City Council. W. A. Fuller Co., 2916 Shenandoah Ave., St. Louis, engrs. Noted Oct. 2.

N. Y., Port Ivory (mail Staten Island) — Procter & Gamble Co., 17 Battery Pl., New York, taking bids general contract 1 story, basement, brick, steel boiler house addition, plain found. $40,000. Private plans. Noted Nov. 6.

CONTRACTS AWARDED

Calif., Herndon—San Joaquin Light & Power Corp., Power Bldg., Fresno, 50,000 kw. steam-operated generating plant burning natural gas, own forces. $4,000,000. H. K. Fox, Power Bldg., Fresno, ch. engr. for owners.

Minn., Blooming Prairie — City, municipal light, heat and power plant, general contract to Nicholas Wagner, Austin, $8,890; diesel engine and generating equipment, to Fairbanks-Morse & Co., Park Sq., St. Paul, $41,668; electrical distribution system, to Keller Electric Co., 1138 Main St., Dubuque, Ia., $14,400. Grand total $64,958. Noted Oct. 20 Daily.

Mo., Independence—City, building and boiler settings for power plant, to G. E. Randall, 701 North Delaware St., Independence, $39,828; ash handling equipment, to Webster Mfg. Co., 1856 North Kostner St., Chicago, Ill., $2,197. Noted Sept. 11.

N. J., Trenton—Dpt. Institutions & Agencies, State Office Bldg., Annex general contract 1 story, basement, 45 x 90 ft., brick, steel, stucco, at New Jersey State Prison, to J. H. Morris & Co., 211 Montgomery St., $29,422. Noted Oct. 23 Daily.

O., Cleveland — Acme Rayon Corp., P. S. Green, pres., 1294 West 70th St., 1 story, brick, steel boiler house addition, to N. J. Pierik, 7016 Euclid Ave. Est. $40,000. Noted Oct. 30.

Wash., Tacoma—City, regulating board, instruments for combustion control on 2 Sterling boilers, at steam generating plant, to Bailey Meter Co., 1038 Ivanhoe Rd., Cleveland, O., $27,734.

WAREHOUSES

PROPOSED WORK

Calif., Santa Rosa—Pacific Gas & Electric Co., 245 Market St., San Francisco, sketches warehouse, transformer house, meter house, service buildings. $60,000. Eng. Dpt. Owners, engrs.

Colo., Pueblo—See "Factories and Mills under Contracts Awarded."

Ill., Bloomington—Brunton Transfer & Storage Co., 525 North Center St., c/o R. N. Brunton, plans by A. F. Moratz, 701 Peoples Bank Bldg., furniture storage warehouse, East St. $40,000.

Mass., Cambridge—W. H. Crane, 1 Hayward St., 1 story, 60 x 200 ft., brick, concrete, steel, storage, concrete found., Binney and Rogers Sts. $40,000. Private plans.

N. J., Passaic—J. Finkelstein, 165 Lafayette Ave., general contract 1 story, basement, brick, to Schurman Constr. Co., 86 Lexington Ave. Est. $150,000. Noted Oct. 9.

N. C., Durham—Amer. Tobacco Co., 111 5th Ave., New York, reconstructing warehouse, recently destroyed by fire. To exceed $100,000. **Maturity indefinite.**

Pa., Braddock—HiGrade Bottling Wks., 922 Talbott Ave., W. Malezewski, secy., soon lets contract 1 story, 51 x 120 ft., brick, steel, 545 Pine Way. $40,000. R. Malszewski, 1301 Massachusetts Ave., Wash., D. C., archt.

N. B., St. John — Harbour Comrs. bids in November, 90 x 800 ft. fertilizer warehouse, wood, pile found. $430,000.

Que., Quebec—Quebec Liquor Comn., warehouse. $300,000.

BIDS ASKED

Ill., Peoria—See "Contracts Awarded."

Mass., Braintree—Town, Municipal Light Dpt., taking bids 1 story, concrete storehouse.

CONTRACTS AWARDED

Calif., Los Angeles—Union Pacific Ry. Co., 7 story, basement, 100 x 620 ft., rein.-con., steel warehouse having cold storage facilities, spur tracks 9th and Alameda Sts., to J. V. McNeil Co., 5860 Avalon Blvd., $3,500,000.

Ill., Peoria—Keystone Steel & Wire Co., South Bartonville, C. W. La Porte, assistant to pres., sketches 1 story, 300 x 400 ft. steel, concrete warehouse, suburb of Peoria, day labor, $100,000. **Maturity 1931.** J. C. Newell, c/o owner, engr. Private plans.

Mass., South Boston (sta. Boston)—Old Colony Ave. Trust, C. H. Hodge, 68 Main St., Watertown, 1 story, brick, steel, warehouse, salesroom, to P. T. McMahon, 1081 Washington St., West Newton. Est. $75,000. Noted Nov. 6.

Mass., Wayland—Wayland Motors Co., State Rd., 1 story, 50 x 100 ft., concrete storage building, concrete found., to A. A. Burgess, Webb St., Lexington. Est. exceeds $150,000. Noted Oct. 2.

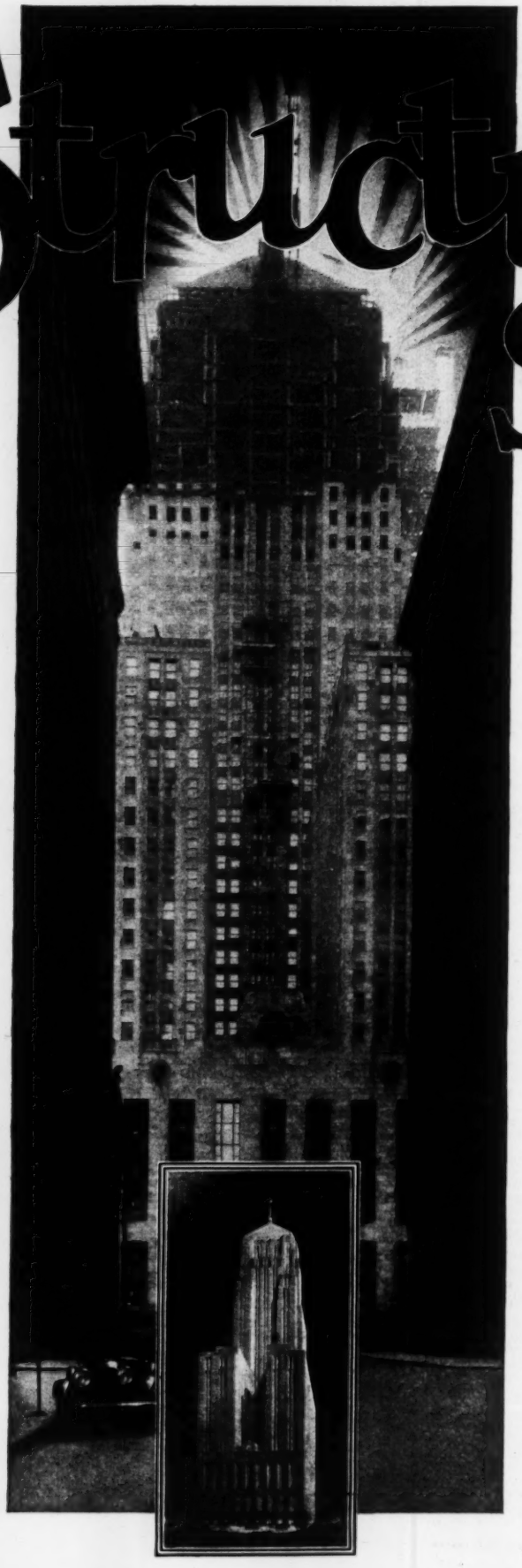
Minn., Minneapolis — Minneapolis Gas Light Co., J. K. Swanson, vice pres. and genl. mgr., 800 Hennepin Ave., general contract 3 story, basement, brick, rein.-con. warehouse and service, to Mads Madsen & C. A. Peterson, 717 Natl. Bank Bldg. Est. $230,000.

Minn., St. Paul — Robert Street Associates, Cushing and Driscoll, 315, 360 Robert St., general contract 3 story, basement, **brick, steel** warehouse and merchandise building, 112 East 6th St., to G. J. Grant Constr. Co., Como Blvd. and Northern Pacific Ry. $25,000, cost plus percentage basis.

See proposal advertising on page 105

Constr. News page 205

Structural Steel



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